

A Comparative Analysis of  
the *Family Adaptability and Cohesion Evaluation Scales*  
Among Traumatized Urban Youth

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## ABSTRACT

### A Comparative Analysis of the *Family Adaptability and Cohesion Evaluation Scales*

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This study compared the Family Adaptability and Cohesion Evaluation Scales, Second Edition (FACES II) scores of traumatized youth diagnosed with posttraumatic stress disorder (PTSD) to the scores of trauma-exposed youth without PTSD and a non-traumatized comparison group. Child diagnostic interviews determined that all participants were free of additional major comorbid disorders. The FACES II scores of children and adolescents with PTSD were not significantly different from the FACES II scores of trauma-exposed youth without PTSD and the non-traumatized comparison group. FACES II scores were also not significantly different between the trauma-exposed youth without PTSD and the non-traumatized comparison group. Accordingly, PTSD and trauma-exposure without PTSD were not associated with variations in the perception of family functioning as measured by the FACES II. Implications for research and practice are considered.

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Siete sempre con me.*

## **Chapter I**

### **THE HISTORY OF POSTTRATUMATIC STRESS**

The term posttraumatic stress disorder (PTSD) was introduced in the third edition of the *Diagnostic and Statistical Manual for Mental Disorders* (DSM-III, American Psychological Association [APA], 1980). Although PTSD has only been recognized as a mental disorder for 34 years, accounts of adverse psychological reactions to trauma have been documented for centuries. This chapter will review historical accounts of posttraumatic stress reactions as well as trends in trauma research that led to the eventual identification of PTSD as a diagnostic concept. Additionally, this chapter will review the development of the PTSD diagnostic criteria from its inception in the DSM-III (APA, 1980) to its latest revision in the DSM-5 (APA, 2013).

This literature review was conducted using PsychInfo and Medline using a multiple search terms and combinations. Terms included “Posttraumatic Stress Disorder” and “history” or “historical accounts”, “Traumatic Neuroses”, “Railroad Spine”, “Shell Shock”, “Gross Stress Reaction”, and “Transient Situational Disturbance”. Result combinations and individual terms were included in the search. All results were reviewed for inclusion. The reference list from two book chapters (Saigh & Bremner, 1999; Saigh, Yasik, Sack, & Koplewicz, 1999) and a journal article (Saigh, Green, & Korol, 1996) were reviewed and relevant citations are described within.

#### **Historical Background**

Historical accounts of posttraumatic stress reactions have been documented for centuries prior to the introduction of the PTSD in the psychiatric nosology. These accounts suggest that across cultures, there has been a long-standing awareness regarding the relationship between exposure to overwhelming stress and adverse psychological and physical symptoms. Medical texts from Ancient Mesopotamia (current day Iraq) dating as far as 1300 B.C. allude to

posttraumatic responses following combat exposure. One account highlights the re-experiencing and sleep disturbance symptoms of an Assyrian soldier involved in a military operation:

If the evening, he sees either a living person or a dead person or someone known to him or someone not known to him or anybody or anything and becomes afraid; he turns around like one who has [been hexed with?] rancid oil, his mouth is seized so that he is unable to cry out to one who sleeps next to him. (cited in Abdul-Hamid & Hughes, 2014, p. 555)

References to posttraumatic reactions are also found in the most prominent works of literature of the Hellenic era. In Homer's classic epics, the *Iliad* and the *Odyssey*, the protagonists, Odysseus and Achilles, are frequently depicted suffering from a variety of posttraumatic reactions including intrusive recollections and sleep disturbances (Ben-Ezra, 2010; Birmes et al., 2003; Shay, 1994).

Further accounts of posttraumatic responses can be found in the works of the Roman philosopher and poet, Lucretius (Ben-Ezra, 2010, Birmes et al. 2003). In the *Da Natura Rerum*, the author recognizes that stressful experiences can be re-experienced in dreams:

And the minds of men, that do big things in thought, Will often act out big things in their dreams: They'll slug it out with kings, be caught, pitch battles And holler as if their throats were cut, in bed; Many lose title bouts and groan in pain, And as if ripped and champed by a panther's jaws or a fierce lion, fill the house with cries; ... Are seized with terror and wake like madmen, hardly returning to themselves, in the seethe of the body. (Lucretius, trans. 1995)

Extending beyond antiquity, historical reactions to traumatic events have been compiled in several reviews of non-medical historical literature. (Ben-Ezra, 2001, 2002, 2004, 2011; Birmes et al., 2003). Collectively, these reviews identify accounts of posttraumatic symptoms such as sleep disturbances, intrusive thoughts and re-experiencing symptoms, within the context of prominent traumatic events in Antiquity (e.g., The Second Punic War), the Middle Ages (e.g., The Black Death) and the Renaissance (e.g., St. Bartholomew's Day Massacre). Outside of the context of historical events, consideration is given to the rich descriptions of posttraumatic reactions found in several Shakespearian plays, which include the re-experiencing and dissociative symptoms of Lady Macbeth (Birmes et al., 2003) and the rape reactions of Lucrece (Ben-Ezra, 2011).

Collectively, these works indicate that chroniclers prior to the 17<sup>th</sup> century demonstrated a recognition of the adverse human reactions to overwhelming stress; however, it is important to note that the literature reviewed thus far did not include personal accounts and was restricted to narratives depicting the posttraumatic reactions of groups of individuals or to the fictional depictions of psychological responses to stress.

Within a historical context, the *Diary of Samuel Pepys* provides a detailed personal account of Mr. Pepys's psychological reactions following his involvement in the extinction of the Great Fire of London in 1666 (Daly, 1983). Several diary entries authored by Pepys suggest that he experienced distinct posttraumatic symptoms in the aftermath of the fire including sleep disturbance, intrusive thoughts, avoidance and depersonalization (Daly, 1983). In an entry written six months after the fire, Pepys recollects:

I did within these six days see smoke still remaining of the late fire in the City; and it is strange to think how to this day I cannot sleep a night without great terrors of the fire; and this very night could not sleep till almost two in the morning through thoughts of fire. (Pepys, 1667 as cited in Daly, 1983, p. 66).

### **The Medical Literature**

During the 19<sup>th</sup> century, medical doctors in Europe were frequently involved in legal litigations between railroad companies and civilians seeking compensation for damages sustained during transportation accidents. While subjective distress was easily attributable to physical injury within the courtroom, a small percentage of accident survivors presented with psychological distress that could not be directly attributed to observable physical damage. In 1866, the British surgeon John Eric Erichsen observed that after having experienced an accident in which a blow was suffered to the spine, some survivors presented with what he referred to as an “anxious expression”. He further noted that their “temper often changed for the worse, the patient being fretful, irritable, and in some way...altered in character” (1866). He additionally reported that their “sleep is disturbed, restless, broken...the dreams are distressing and horrible” (Erichsen, 1867). Erichsen concluded that these symptoms were caused by physical shock to the nervous system, a condition he referred to as “railroad spine.”

The belief in the organic bases of posttraumatic stress reactions remained prevalent in the medical literature of the 19<sup>th</sup> century. Herman Oppenheim, a prominent German neurologist, attributed posttraumatic symptoms to molecular fluctuations resulting from physical reactions to fear, which he referred to as “traumatic neuroses” (Holdorff & Denning, 2011). In 1889, the American Neurologist S.V. Clevenger coined the term “Erichsen’s Disease” in support of the diagnosis of railroad spine (Keller & Chappell, 1996). Like Oppenheim, Clevenger supported the

view that molecular disturbances in the nervous system served as the pathogenesis of posttraumatic symptoms (Trimble, 1985).

Purely physiological explanations of posttraumatic distress gained acceptance amongst military doctors during the 19<sup>th</sup> century, as these explanations allowed military entities to attribute acts of misconduct on the part of soldiers to physical injury rather than cowardice (van der Koll, 2007). During the American Civil War, the physician Jacob Mendez Da Costa observed that physically healthy soldiers involved in the civil war demonstrated symptoms such as a rapid pulse, difficulty breathing, increased irritability and sleep disturbances. Da Costa (1951) conceptualized these symptoms as physiological responses to stressors of combat, a condition which he initially coined “irritable heart” and was later referred to as “Da Costa’s Syndrome” (Saigh & Bremner, 1999) and “Soldier’s Heart” (Jablensky, 1985).

Despite their popularity during the 19<sup>th</sup> century, views supporting the organic origin of posttraumatic symptoms were not unanimously accepted. In 1883, the British surgeon Herbert Page openly refuted Erichson’s “railroad spine” phenomenon, by claiming that there was insufficient evidence to support the view that the symptoms of railroad spine were of a purely organic origin. Page proposed the term “general nervous shock” to describe the adverse psychological reactions that developed over time in victims of railroad accidents (1883). Specifically, he observed that even after their physical injuries healed, victims of railroad accidents demonstrated “complaints of being easily startled...a sense of depression and melancholy...hopelessness as to future prospects...screaming at night...irritability of temper...(Page, 1883, p. 161). Page asserted that the origin of these symptoms could be purely psychological. Within this context, he represented that “many errors in diagnosis have been made because fright has not been considered in itself sufficient” (Page, 1883, pg. 148). The



Swiss psychiatrist Edouard Stierlin (1909, 1911) conducted a study on the aftermath of a large-scale earthquake that led to the death of 70,000 individuals in Messina, Italy. He observed that 25% of the survivors presented with sleep disturbances and frequent nightmares (McFarlane & Potts, 1999). Stierlin concluded that the experience of posttraumatic reactions could occur in non-clinical populations and be purely psychogenic in nature (van der Kolk, 2007).

While debate ensued regarding the organic versus non-organic origins of posttraumatic reactions, the majority of the medical community agreed that symptoms resulting from exposure to trauma could be conceptualized within the framework of hysteria. In Paris, the French neurologist and head of the Salpêtrière psychiatric hospital, Jean-Martin Charcot, observed that a commonality between hysteria patients was a history of trauma (Herman, 1942; van der Kolk, 2007). While Charcot's studies were predominantly focused on the taxonomy of the various symptoms of hysteria, two of his supporters, Pierre Janet and Sigmund Freud, sought to further explore the etiology of the disorder. At the very beginning of the 20<sup>th</sup> century, Pierre Janet was amongst the first to assert that hysteria was a disorder caused by exposure to psychological trauma (Herman, 1942). Janet believed that the experience of “vehement emotions” during a traumatic event leads to the splitting of the traumatic memories from consciousness, as these cannot be matched to existing cognitive schemas (von der Kalk, 2006). For this reason, traumatic memories are not accessible to the traumatized individual; hence, they cannot not be processed and integrated into ordinary consciousness. The failure of integration led to what Janet referred to as episodes of “dissociation”, in which intrusive traumatic memories are re-experienced through somatic and psychological responses that mirror those of the original trauma (van der Kalk, 2006).

Like Janet, Freud acknowledged that symptoms of hysteria were rooted in trauma and were experienced as a result of the failure to integrate traumatic memories (Herman, 1942). In his collaborative work with Breuer, he indicated “The traumatic experience is constantly forcing itself upon the patient and that this is proof of the strength of that experience: the patient is, as one might say, fixated on his trauma” (Breuer & Freud, 1893 quoted in van der Kolk, 2007 p. 24). Prior to the establishment of psychoanalysis, Freud’s studies of hysteric patients, both men and women, led to his realization that many were victims of sexual abuse, incest, and other traumas as children (Herman, 1942). This discovery led to Freud’s claim that “at the bottom of every case of hysteria there are one or more occurrences of premature sexual experiences, which belong to the earliest years of childhood (quoted in Herman, 1942 p. 13). However, Freud abandoned this line of inquiry, presumably as a result of the socially unacceptable implication that the sexual abuse of children was common given the frequency of individuals diagnosed with hysteria at the time (Herman, 1942).

Outside of the research on hysteria, posttraumatic stress reactions were recognized in an early classification system of mental health disorders formulated by Emil Kraepelin at the end of the 19<sup>th</sup> century. Kraepelin coined the term “schreckneurose”, or “fright neuroses”, in order to describe a psychological condition “composed of multiple nervous and psychiatric phenomena arising as a result of severe emotional upheaval or sudden fright which would build up great anxiety” (Kraepelin, 1896, translated by Jablenski, 1985, p.737).

### **War Related Accounts**

The advent of World War I provided the scientific community with the opportunity observe posttraumatic reactions in soldiers following one of the most horrific military

confrontations in modern history. Mott (1919) described an account of the traumatic experiences of soldiers fighting in trench warfare:

He [Private C R] was carrying sandbags in the company of thirty in daylight and under shell fire. The explosions flung him into a deep hole, and he climbed out to see all of his friends lying around dead. This was his first sight of death, and he keeps seeing it again, both awake and sleep, with bright lights and bursting shells. He does not hear the shells, but sometime the men shouting. He sometimes *dreams* that he hears the shells exploding and the shouts of men... When admitted to the hospital he presented an expect of extreme terror (Mott, 1919, p. 32)

Throughout World War I the term “shell shock” was frequently used to describe a host of physical and psychological stress reactions in soldiers who survived shell explosions. While many physicians stood firm in their belief that “shell shock” was caused by unobservable cerebral lesions caused by concussion, psychological explanations for this same condition were also proposed. (Jones, Fear & Wessly, 2007). In 1915, the British psychologist Charles Myers observed that many soldiers diagnosed with shell shock were never exposed to shell fire but still exhibited symptoms of shell shock such as increased arousal, fatigue, memory loss, sleep disturbance and physical tremors (Myers, 1940). Myers ascribed these symptoms to the stressors related to trench warfare and concluded that “A shell, then, may play no part whatsoever in the causation of “shell shock”: excessive emotion, e.g. sudden horror or fear – indeed any “psychical trauma” or “inadjustable experience” – is sufficient” (p. 28). Myers, taking from Janet’s work on hysteria, argued that the symptoms of shell shock were the result of “dissociation” and similar to those of individuals suffering from hysteria (Myers, 1940).

Analogously, Southard (1919) compiled the psychiatric case histories of over 500 World War I soldiers diagnosed with “shell shock”. While many of the cases reported were soldiers who suffered from head injuries, Southard identified several cases in which posttraumatic stress reactions were noted in the absence of a concussive injury. Southard (1919) described the personal account of a soldier who spent several months under the harsh conditions of trench warfare:

My nervous state, which I thought ought to last not more than a fortnight, still persists more than three, or almost four, months after being evacuated, although the trembling is a little less...The subway gate noises, a flaring light, a locomotive whistle, the barking of a dog, or some boyish prank is enough to set off the trembling. (p. 311)

In a separate account, Southard describes the startle response of a soldier who survived a shell explosion that killed the rest of his comrades. He reported, “The pulse was variable; at rest it stood at 60; if a table nearby was struck suddenly, the pulse would go up to 120” (1919, p. 309).

Abram Kardiner (1941), an American psychiatrist, was amongst the first to provide operational definitions of posttraumatic reactions. In his book *The Traumatic Neuroses of War*, Kardiner (1941) refers to “traumatic neuroses” as a syndrome characterized by five distinct features common to all cases of traumatic neuroses: fixation on the trauma, persistent dreams related to the trauma, impaired daily functioning, a state of readiness for fright reactions and a tendency to act aggressively. Kardiner (1941) recognized that posttraumatic symptomology could result not only from organic damage to the brain, but also from exposure to overwhelming stress in both military and civilian experiences. He advocated for the use psychotherapy as a treatment for traumatic neuroses, as he observed that traumatized patients who were encouraged

to discuss their trauma often saw decreases in posttraumatic symptoms. Within the same period of time, Adler (1941) observed the psychological sequelae of survivors of Boston's Coconut Grove fire disaster, an event which led to the death of 491 patrons of the nightclub. The author noted that a percentage of survivors complained of uncontrollable anxiety and nightmares related to the traumatic events for up to nine months since the disaster (Adler, 1941).

Research on psychological reactions following combat exposure continued to develop during World War II. For the first time, military psychiatrists acknowledged that any man, regardless of their composure, can be subject to the adverse impact of psychological stress resulting from combat (Herman, 1942). Within this context, Grinker and Spiegel (1945) described the clinical presentations of numerous United States Air Force soldiers who served in World War II. The authors observed that many of these servicemen suffered from "operational fatigue", a term they used to describe a wide range of physical (e.g., tremors) and psychological (e.g. neuroses) reactions following combat exposure. The most frequently reported symptoms by patients suffering from operational fatigue were restlessness, irritability, aggressive behaviors, fatigue, difficulty sleeping, subjective anxiety, preoccupation with combat experiences and nightmares (Grinker & Spiegel, 1945). In one account, the authors describe the case of a 23-year-old bomber pilot who began demonstrating various posttraumatic reactions following two distinct missions in which he nearly lost his life. The authors report:

Twice he had narrowly missed death because of an unnecessary preoccupation with his job. He began to dread going on missions, afraid of what he might do or forget to do. He would lie awake at night, tense and anxious, and think about flying. He kept seeing the mountains suddenly flash in front of his field of visions. If he fell asleep, he dreamed that his plane was disabled and was falling, and that, although he struggled in terror, he could not get out of it. During the day, when he was at leisure, it was impossible to relax. He stopped playing cards with his friends because he could not concentrate...Mission after mission came and went with no change in his grinding anxiety. He decided to talk over the whole matter with his flight surgeon after his fifty-fourth mission...As he sat down and managed to light a cigarette, in spite of his trembling hands, he said in an anguished

voice, “Doc, I can’t eat and I can’t sleep, and I feel jittery all the time. I don’t know what’s the matter with me... (p. 87)

Outside of studies pertaining to the stress reaction of military personnel during World War II, several studies were conducted to investigate the psychological impact of war events on civilians. Lewis (1942) reviewed reports of civilian psychiatric casualties from various cities in England and observed that the instances of patients reporting neurosis was higher during periods of frequent bombing. Additionally, he reported that the most commonly reported symptoms following air raids were increased levels of anxiety and depression typically occurring a week to ten days after the bombing. In a similar investigation, Fraser, Leslie and Phelps (1942) interviewed 127 British individuals ten months after their admission to the First Aid Posts following an air raid. The authors observed that approximately half the sample experienced elevated levels of anxiety and depression at the time of the interview. The authors ascribed the psychological symptoms experienced by these air raid survivors to the overwhelmingly stressful nature of their subjective experience (Fraser, Leslie, & Phelps, 1942).

World War II brought forth increased interest in the psychological adjustment of children who experienced war related traumas. Bodman (1941), surveyed 8,000 British school children who were exposed to air raids and observed that of the 8,000 trauma-exposed children, 120 suffered from severe psychological symptoms. Specifically, Bodman (1941) reported that children between the ages of five and seven reported more psychosomatic symptoms compared to children between the ages of 11 and 14, who were more likely to demonstrate elevated levels of anxiety. Additionally, Bodman (1941) conducted a follow up observation of a separate sample of 54 children who experienced a severe air raid. The author reported that only four children from this sample suffered from persistent psychological symptoms seven months after the air raid. A parent report describing the adjustment of one of these four children indicated that “she

screams at night, talks and shouts in her sleep, cries when spoken to, picks sores on her fingers and face, suffers from diurnal and nocturnal enuresis, and soils herself” (Bodman, 1941, p. 486). Still within the context of children’s reactions to air raids, Lewis (1941) reported that out of the 15,000 thousand children who evacuated from London in 1941, 420 (age range: 7-11) reported severe posttraumatic reactions such symptoms such enuresis, hysterical vomiting, tics, sleep-walking, as well as increased anxiety and depression.

In a similar investigation, Carey-Trefzer (1949) reported the posttraumatic reactions of 212 British children exposed to an array of war related stressors including air raids, evacuation, change in family life, loss of schooling and housing problems. The authors observed that exposure to bombing and changes in family life were the two stressors correlated with a higher frequency of psychological symptoms. Amongst the sample, changes in behavior were identified as the most commonly reported symptoms. These were followed by sleep disturbances, enuresis, stammer, tics and school difficulties (Carey-Trefzer, 1949).

Outside of Britain, Mercer and Despert (1943) observed posttraumatic reactions including avoidance behaviors, increased heart rate, bedwetting, intrusive recollections and difficulty concentrating in a sample of French children exposed to a variety of traumatic war experiences. Similarly, Brander (1943) documented the psychological adjustment of children, who along with their families, were forced to leave their homes during the Russo-Finish war. The author described the traumatic experiences endured by these families, which included transport in unheated railroad carriages and periodic exposure to machine gun fire from Soviet aircrafts (Brander, 1943). The author reported that a percentage of these children suffered from nightmares, were fearful, and exhibited avoidance behaviors. Furthermore, he observed how

psychological reactivity to war related stimuli persisted a year after exposure to the original trauma (1943).

Shortly after World War II, several studies sought to examine the psychological sequelae of individuals who experienced imprisonment in Nazi death camps and military prisons. Within this context, Friedman (1949) coined the term “Buchenwald Syndrome” to describe a cluster of symptoms observed in Jewish youth who survived the Nazi concentration camps and were placed in a detention center in Cyprus. Friedman (1949) reported that approximately half of the observed children suffered from somatic complaints in the absence of physical illness. Further, he reported that these youth experienced sleep disturbances, fear, hypervigilance as well as “affective anesthesia” (Friedman, 1948). Within the same line of research, the term “concentration camp syndrome” was coined by Ettinger (1962) to describe a cluster of posttraumatic stress reactions observed in a sample of 100 Norwegian concentration camp survivors. Ettinger (1962) made reference to symptoms such as fatigue, difficulty concentrating, irritability, as well as re-experiencing symptoms triggered by neutral environmental stimuli. Analogously, Wolf and Ripley (1947) described the posttraumatic reactions of a sample of U.S. prisoners of war shortly after their release from Japanese prison camps in which they were subjected to frequent torture, scarce rations and forced labor. Wolf and Ripley (1947) reported that approximately a quarter of the veterans that returned to the U.S. demonstrated blunt affect, experienced war related nightmares, depression, chronic fatigue and increased anger.

### **The DSM-I: Gross Stress Reaction**

As a result of the increase in psychiatric morbidity following the First and Second World Wars, the American Psychiatric Association’s (APA) Committee on Nomenclature and Statistics included the psychiatric diagnosis of “Gross Stress Reaction” to the first edition of the



Diagnostic and Statistical Manual of Mental Disorders (APA, 1952). The DSM-I defined “Gross Stress Reaction” as a transitory condition stemming from exposure to “severe physical demands or extreme emotional stress, such as in combat or civilian catastrophe (fire, earthquake, explosions, etc.)” (APA, 1952, p. 40). The manual specified that this diagnosis was appropriate for individuals considered “normal” prior to involvement in either a combat or civilian catastrophe (APA, 1952). Although the inclusion of “Gross Stress Reaction” in the psychiatric nomenclature formally marked the recognition of the adverse effects of trauma exposure on psychological functioning, the manual did not provide the specific operational criteria required to reliably formulate this diagnosis (Saigh & Bremner, 1999).

Scientific research on posttraumatic distress continued to develop following the publication of the DSM-I. Within the context of the Korean War, Noble, Roudebush and Prince (1952) interviewed a cohort of 75 U.S. combat exposed servicemen who were hospitalized in orthopedic wards as a result of fractures and other injuries sustained in combat. Out of the 75 hospitalized soldiers, 42 demonstrated psychiatric symptoms including startle reactions, combat nightmares and slight stammering. Additionally, the authors reported that three of the 75 soldiers presented with severe “delayed battle reactions” (Noble et al., 1952). They described one soldier who “while out on furlough threw himself in the street when a car back-fired and had to be helped up by a policeman” (Noble et al., 1952, pg. 496). Comparisons between severely and moderately wounded soldiers revealed comparable levels of psychopathology; hence, the researchers concluded that the instance of psychiatric morbidity was unrelated to the severity of physical injury, and was more likely due to factors such as “personality, pre-combat and combat experience” (Noble et al., 1952).

In 1956, Temperau described the reactions of 15 U.S. Air Force pilots who reported fear of flying. Two of these pilots had experienced traumatic events as a result of flying and reported feeling nervous and confused during subsequent flights. Specifically, the author describes the reactions of one pilot who was forced to abandon his airplane during a thunderstorm:

He quickly found that whenever it became necessary to fly in “weather” he felt panicky, lost confidence in his instruments, and seemed to be obsessed with the idea that he would crash. The instrument panel seemed somehow strange und unfamiliar and the cross checking on instruments necessary to determine his aircraft altitude became labored, no longer automatic (Temperau, 1952, p. 221).

Temperau (1952) concluded that the emergence of anxiety in these pilots could be ascribed to “A harrowing experience or the death of a close friend in an aircraft” (p. 220).

While the DSM-I conceptualized “Gross Stress Reaction” as a transient condition thought to dissipate quickly with treatment, Archibald, Long, Tuddenham and Miller (1962) suggested that symptoms of Gross Stress Reaction may persist for prolonged periods of time. In their study, they observed that a sample of 65 World War II combat veterans continued to report posttraumatic responses 15 years following their combat experiences. They observed that 70% of the sample reported persistent “tension, irritability, depression, diffuse anxiety symptoms and headaches” (Archibald et al., 1962, p.47)

Outside of research on combat veterans, Bloch, Silber and Perry (1956) examined the psychological reactions of a group of 185 children exposed to the devastation caused by a tornado that struck Vicksburg, Mississippi in 1953. Two months following the disaster, the authors identified 47 children who suffered from symptoms including night terrors, avoidance of trauma related stimuli, re-experiencing symptoms, enuresis and increased irritability (Bloch et

el., 1956). Similar psychological reactions in children were also reported in the aftermath of a cyclone that struck Oregon in 1962 (Crawshaw, 1962).

### **The DSM-II: Transient Situational Disturbance**

In 1968, the diagnosis of “Gross Stress Reaction” was omitted from the APA’s second edition of the DSM (DSM-II; APA, 1968). Instead, the term “Transient Situational Disturbances” was introduced to describe “transient disorders of any severity (including those of psychotic proportions) that occur in individuals without any apparent underlying mental disorders and that represent an acute reaction to overwhelming environmental stress” (APA, 1968, p. 48). The manual included a variety of sub-classifications used to further specify the diagnosis. These sub-classifications were assigned on the basis of developmental stages and differentiated between adjustment reactions in infancy (e.g., crying spells, loss of appetite), childhood (e.g., attention-getting behavior, nocturnal enuresis), adolescence (e.g., irritability and depression), adult life (e.g., suicidal gestures, trembling) and late adulthood (e.g., feelings of rejection). A few examples of stressors associated with each developmental period were provided, such as separation from parents and exposure to military combat (APA, 1968). Nonetheless, the classification of “Transient Situational Disturbance” did not include operationalized criteria necessary to make a diagnosis (Saigh & Bremner, 1999).

The years following the publication of the DSM-II saw a continued expansion of the body of literature related to the adverse effects of trauma exposure. During the 1970’s, social pressure from antiwar Vietnam Veteran associations contributed to a burgeoning of research related to the adjustment of Vietnam Veterans returning from active duty. Within this context, DeFazio, Rustin and Diamond (1975) conducted an investigation in which they assessed the adjustment of 92 Vietnam veterans. Half of the veterans surveyed were combat exposed for at

least six months and had fired a weapon in combat. The other half of the sample were non-combat exposed Vietnam veterans. Each veteran was administered a questionnaire and symptom checklist based on selected items of the MMPI and the Mooney Problem Checklist (Mooney & Gordon, 1950). The researchers observed that combat exposed veterans demonstrated a significantly higher number of symptoms compared to non-exposed Vietnam veterans both immediately after their discharge and at the time of the questionnaire (at least five years after discharge). Compared to non-combat exposed Vietnam veterans, combat exposed veterans reported more frequent symptoms that included disturbed sleep, the belief that life is a strain, the inability to relax, feeling like a “hothead”, and feeling nervous. At the time of the survey, symptoms such as disturbed sleep, feeling nervous and difficulty relating to other people were significantly higher amongst combat-exposed veterans. Particularly, the authors noted that some veterans reported symptoms that were directly related to the original traumatic experience. The authors reported select experiences from veterans:

...each time the temperature in their apartments rose to about 75-80 F, they experienced additional terrifying combat nightmares upon falling asleep. The heat of the apartment immediately reminded each of the heat of Vietnam. In still other cases sudden summer downpours (a reminder of the monsoon) set off new and disturbing symptoms (DeFazio et al., 1975, p. 162)

Within the context of studies related to the psychological adjustment of Vietnam veterans, Horowitz and Solomon (1975) reviewed the case histories of several veterans at two separate Veterans Administration hospitals. Based on their observations, the authors predicted that veterans returning from service would experience an initial period of relative psychiatric and physical stability followed by the onset of posttraumatic syndromes including nightmares,

adverse emotional reactions, aggressive and self-destructive behaviors, flashbacks, and impaired social functioning (Horowitz & Solomon, 1975). The authors referred to this cluster of symptoms as “delayed stress response syndrome” given their prediction that unassimilated traumatic memories may lead to intrusive and repetitive symptoms several months or even years following the original stressor (Horowitz & Solomon, 1975). In an analogous study, Figley (1978) used a self-report questionnaire to retrospectively compare levels of interpersonal adjustment between combat exposed and non-combat exposed Vietnam veterans who had recently returned from service. The authors defined interpersonal adjustments as a “state of general emotional well-being, satisfaction and relative comfort with others in general, and with intimate family and friends in particular” (Figley, 1978, p. 107). The authors did not observe significant differences in levels of interpersonal adjustment between the two groups prior to military service. However, combat exposed veterans demonstrated lower levels of self-reported interpersonal adjustment during the period of military service, one year after service, and during the period of time in which the questionnaire was completed (Figley, 1978).

While research dedicated to the psychiatric impact of war related stressors was fueled by demand from Vietnam Veteran associations, social pressure from the feminist movement of the 1970’s saw the proliferation of research aimed at exploring the psychological effects of sexual assault. In one such study, Burgess and Holmstrom (1974) interviewed 92 women who were admitted to the Boston City Hospital emergency room after experiencing a sexual assault. These victims described the experience of rape as life-threatening, as they feared being seriously injured or killed during the event. The authors used the term “rape trauma syndrome” to describe the acute (e.g., sleep-pattern disturbance, muscular tension) and long-term (e.g., repetitive nightmares, startle response) symptoms reported by rape victims (Burgess & Holmstrom, 1974).

Notably, the authors reported that many of the psychological symptoms reported by these women were analogous to those experienced by combat veterans (Burgess & Holmstrom, 1974). In a similar investigation, Walker (1979) used the term “battered woman syndrome” to describe the posttraumatic reactions of 400 women who had experience sexual, physical, and emotional assault within an intimate romantic relationship. The authors noted that many of these women experienced re-experiencing symptoms related to the battering event, as well as high levels of anxiety and avoidance behaviors (1979).

The 1970’s also saw a continued interest in the psychological impact of disasters. On February 26<sup>th</sup>, 1972, the flood at Buffalo Creek, West Virginia, killed 125 people, injured 1,100 and left 4,000 people homeless in a matter of hours. Two years after the disaster, Newman (1976) interviewed 224 children who experienced traumatic stressors related to the flood. The author noted that child survivors developed an increased awareness of their own mortality and exhibited increased rates of enuresis, sleep disturbances, nightmares and phobias related to the flood (Newman, 1976). In a concurrent evaluation of the children’s parents, Titchener and Kapp (1976), observed that 80% of the adult survivors of the flood demonstrated posttraumatic stress reactions including recurring nightmares and the development of water-related phobias.

Additionally, the authors noted that in the years following the disaster, the vast majority of the interviewed survivors had a markedly decreased interest in activities they previously enjoyed, and became “listless, apathetic and less social since the disaster” (Titchener & Kapp, 1976, p. 297). Within the context of children’s stress reactions to disaster, similar posttraumatic reactions were observed in children after a landslide disaster (Lacey, 1972) and after a lightning-strike incident (Myers, Colgan & VanDyke, 1977).

### **The DSM-III and the DSM-III-R: Posttraumatic Stress Disorder**

The literature reviewed thus far provides a substantial indication that exposure to trauma may lead to the development of adverse psychological reactions. Starting in the 17<sup>th</sup> century, terms such as “Soldier’s Heart”, “Traumatic Neuroses”, “Gross Stress Reaction” and “Battered Woman’s Syndrome” have attempted to define the cluster of posttraumatic stress responses commonly observed after exposure to overwhelming stress. While the research that led to the creation of these terms brought increased awareness to the psychological impact of trauma, by the late 1970’s the field of trauma research was theoretically splintered and impeded by a lack of theoretical focus and competing terminology (Saigh, 1992a). As a response to the DSM-I and DSM-II’s lack of operational criteria, poor reliability, and a relatively limited number of classifications (Morey, Skinner, & Blashfield, 1986; Saigh, 1992a), the APA appointed Robert Spitzer to head a task force whose scope was to revise and expand the manual (Saigh & Bremner, 1999). During this third revision, operational criteria for 256 psychiatric classifications were created and a multiaxial diagnostic assessment system was introduced. Drawing upon clinical experience and extensive reviews of the literature, the DSM-III Reactive Disorders Committee defined the diagnostic criteria for what became Posttraumatic Stress Disorder (PTSD; Saigh & Bremner, 1999) in the DSM-III (APA, 1980).

Published in 1980, the DSM-III characterized PTSD as the “development of characteristic symptoms following a psychologically traumatic event that is generally beyond the range of usual human experience” (APA, 1980, p. 236). Further, the manual specified that “the stressor producing this syndrome would evoke significant symptoms of distress in most people

and is generally outside the range of such common experiences as simple bereavement, chronic illness, business losses or marital conflict” (APA, 1980, p. 236). Notably, this new diagnostic classification aimed to integrate practice and theory by recognizing that diverse stressors (e.g., natural disasters, combat exposure, and sexual assault) may elicit comparable patterns of posttraumatic stress reactions (Saigh & Bremner, 1999).

The DSM-III definition of PTSD was comprised of four distinct criteria, including exposure to a recognizable stressor, re-experiencing symptoms (e.g., recurrent dreams, intrusive recollections), psychic numbing (e.g., feeling of detachment from others, constricted affect), and at least two symptoms that were not present before the trauma such as an exaggerated startle response, survivor guilt, and memory impairments. (APA, 1980). Additionally, the manual differentiated between an acute symptom presentation (within a six month period), a chronic presentation (persisting for more than six months following the traumatic experience) and a delayed presentation (onset of symptoms at least six months after the traumatic event). Notably, while the DSM-III stated that PTSD may develop during childhood, it did not specify the unique presentation of symptoms in trauma-exposed children and adolescents (Saigh & Bremner, 1999).

Following the publication of the DSM-III, several investigations sought to examine the construct validity of the PTSD diagnostic criteria. One such study conducted by Zimering, Caddell, Fairbank and Keane (1993) investigated the validity of six of the DSM-III PTSD criteria, including: intrusive thoughts, reactivity, emotional numbing, impairments in concentration and increased arousal. A sample of 32 Vietnam veterans participated in the study. Sixteen veterans were identified as meeting DSM-III criteria for PTSD using the Jackson PTSD Structured Interview (Keane, Fairbank, Caddell, Zimering, & Bender 1985) and a subscale from the MMPI that was validated on Vietnam veterans (Fairbank, Keane & Malloy, 1993; Keane,



Malloy, & Fairbank, 1984). Additionally, the authors reported using a validated “laboratory based psychological assessment procedure” (Zimering et al., 1993, p.229) to confirm the diagnosis. The comparison group was comprised of 16 Vietnam veterans who did not meet DSM-III criteria for PTSD based on results from the MMPI-PTSD subscale, a PTSD symptom checklist, and a clinical interview. PTSD symptoms were assessed through laboratory tasks and questionnaires that were administered to both the PTSD and non-PTSD group. During the laboratory tasks, symptom severity was assessed by recording subjective units of distress (SUDS), as through heart rate measurements. The authors reported that for the exception of a task aimed at measuring memory impairment, all administered tasks were successful in discriminating between veterans with PTSD and veterans without PTSD. Taken together, the authors concluded that these results provided empirical evidence to support the DSM-III PTSD classification (Zimering et al., 1993).

In a related study, Blanchard, Kolb, Gerardi, Ryan and Pallmeyer (1986) sought to determine differences in cardiac responses between a sample of 51 Vietnam veterans who met DSM-III PTSD criteria, and a sample of 34 combat veterans who did not meet criteria. All participants were assessed for PTSD using multiple DSM-III based PTSD clinical interviews or through the Anxiety Disorders Interview Schedule (ADIS; DiNardo, O’Brien, Barlow, Waddell, & Blanchard, 1986; Blanchard, Gerardi, Kolb, & Barlow, 1986), a structured clinical interview which has been shown to accurately discriminate combat veterans with PTSD from those without PTSD (Blanchard et al., 1982). The researchers collected baseline heart rates for all participants, followed by a measurement of heart rate during a mental arithmetic task. Cardiac responses were then recorded during a condition in which veterans listened to increasingly louder audio recordings that alternated between epoch music and combat sounds (e.g., machine gun sounds,

helicopter sounds). The researchers observed that compared to combat veterans without PTSD, combat veterans with PTSD demonstrated a significantly higher cardiac response during exposures to combat sounds. Additionally, baseline resting heart rates were significantly elevated in veterans diagnosed with PTSD compared to those without the diagnosis (Blanchard et al., 1986). In a similar study, Malloy, Fairbank and Keane (1983), compared the physiological responses (e.g., heart rate, skin resistance) and subjective reports of anxiety ten Vietnam veterans who met DSM-III criteria for PTSD (PTSD Group), ten psychiatric inpatients not diagnosed with PTSD (Psych Group) and ten well-adjusted veterans (Normal Group). Participants in each group were exposed to the same experimental procedure in which they watched a neutral video recording of a shopping scene followed by a video recording depicting combat (e.g., soldier under fire). The authors also recorded avoidant behavior by presenting participants with the option of terminating the video by pressing a button. The results of the study indicated that the three groups demonstrated similar physiological responses during baseline recording and during the viewing of the neutral tape. However, while the Normal and Psych group displayed little physiological change during the combat scene, the PTSD group exhibited markedly elevated levels of heart rate and self-reported levels of anxiety. Additionally, eight out of the ten veterans chose to terminate viewing of the combat tape after an average of six scenes. None of the participants in the Psych or Normal group terminated the tape. These laboratory studies collectively provide evidence that the psychological and physiological responses of veterans with PTSD could be distinguished from those of normally adjusted individuals and from those suffering from other psychopathology, providing support for the diagnostic validity of the PTSD diagnosis.

A cross-cultural validation study of the DSM-III PTSD criteria was conducted by Kinzie, Fredrickson, Ben, Fleck, and Karls (1984) using a sample of 13 adult Cambodian concentration camp survivors. Each participant was assessed for PTSD symptoms through clinical interviews and the DSM-III based PTSD section of the Diagnostic Interview Schedule (Robbins et al., 1982). The authors noted that the sample of Cambodian refugees experienced avoidance of thoughts and exhibited several re-experiencing symptoms in the form of intrusive thoughts and nightmares. Additionally, many of the refugees presented with exaggerated startle responses, concentration difficulties and disturbed sleep. The authors noted that the symptoms of Cambodian refugees were comparable to those of concentration camp survivors in Western populations, thus providing cross-cultural validation of the DSM-III PTSD classification (Kinzie et al., 1984).

Saigh (1988, 1989a) conducted the first series of studies aimed at examining the validity of the DSM-III PTSD classification in children and adolescents. In one investigation, Saigh (1988) evaluated 72 Lebanese adolescents who had been exposed to war-related traumas. Of these, 24 met DSM-III criteria for PTSD, 24 were diagnosed with a simple phobia of testing and 24 were not diagnosed with any mental disorder. Diagnoses were established through the use of clinical interviews and individual administrations of the DSM-III version of the Children's PTSD inventory (CPTSDI; Saigh, 1987). All participants also received administrations of the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), the Children's Depression Inventory (CDI; Kovacs, 1981); the Test Anxiety Inventory (TAI; Spielberger, 1980), and the Conners Teacher Rating Scales (CTRS; Conners, 1969). The results of this investigation supported the validity of the DSM-III classification, as the author observed that adolescents with PTSD reported higher levels of anxiety, depression, and were rated as more

disruptive compared to adolescents with simple phobia and controls (Saigh, 1988). Notably, the simple phobia group demonstrated higher TAI scores compared to the PTSD group, providing further support for the differential validity of the PTSD classification (Saigh, 1988).

In an analogous investigation, Saigh (1989) administered the Children's PTSD Inventory (Saigh, 1987), the RCMAS (Reynolds & Richmond, 1978), the CDI (Kovacs, 1981) and the CTRS (Conners, 1969) to a sample of 241 Lebanese children with PTSD (mean age = 10.36 years), 32 children with a simple phobia of testing (mean age = 10.71) and a group of 35 children with no diagnosis (mean age = 10.35). The results of this investigation were congruent with those of the study that examined adolescents (Saigh, 1988), as significantly higher levels of depression, anxiety and misconduct were observed in children with PTSD compared to children with simple phobia and controls (Saigh, 1989). Taken together, these two investigations provided empirical support for the validity of the DSM-III PTSD criteria as it pertained to children and adolescents.

Three years after its release and widespread acceptance, the DSM-III began a process of revision (Saigh & Bremner, 1999). In 1987, the Diagnostic and Statistical Manual of Mental Disorders-Revised (DSM-III-R; APA, 1987) was published. With regard to the diagnostic criteria for PTSD, this revision further organized symptoms into three clusters: re-experiencing, numbing/avoidance, and psychophysiological reactivity (Saigh, Green, & Korol, 1996). The re-experiencing cluster was expanded to require a minimum of one of four possible re-experiencing symptoms. Likewise, the numbing/avoidance symptom cluster was expanded to include a minimum of three out of seven possible symptoms. Feelings of guilt were not included in the newly created psychophysiological reactivity cluster, which encapsulated symptoms related to increased arousal. Remarkably, the DSM-III-R also provided information regarding the

presentation of PTSD symptoms in children, noting that re-experiencing symptoms may present in the form of “repetitive play in which the themes of the trauma are expressed” (APA, 1987, p.250). Additionally, the manual described that children may experience a regression in newly acquired developmental skills and that symptoms of arousal may manifest in the form of somatic complaints (APA, 1987). Despite these indications, this latest revision only offered marginal information regarding the variance of posttraumatic reactions throughout childhood and adolescence (Saigh & Bremner, 1999).

Within the context of the DSM-III-R PTSD classification, Saigh (1991) sought to examine potential differences in the development of childhood PTSD following four different types of traumatization. The author utilized a sample of 230 Lebanese children diagnosed with PTSD. Of these, 128 were traumatized through observation (e.g., witnessing an execution), 58 were traumatized through direct experience (e.g., being abducted), 13 were traumatized through verbal mediation (e.g., they heard about a classmate who was shot), and 31 experienced a combination of these. A comparison sample of 35 healthy children was also utilized. The author assessed levels of anxiety, depression and conduct problems using the RCMAS (Reynolds & Richmond, 1978), the CDI (Kovacs, 1981) and the CTRS (Conners, 1969), respectively. The results of the investigation indicated that children with PTSD demonstrated significantly higher scores in terms of depression, anxiety and misconduct problems compared to the control group. However, no significant differences in RCMAS, CDI and CTRS scores were noted between the four types of traumatization (Saigh, 1991). Taken together, these results not only validate the PTSD diagnostic classification as it pertains to youth, but they also provided support for the previously untested hypothesis that PTSD may develop solely through verbal mediation.

Numerous investigations conducted since the publication of the DSM-III-R provided additional insight into the characteristic and features of PTSD across a variety of populations. For example, Housekamp & Foy (1991) assessed 26 women who had been involved in a physically violent relationship and determined that 45% of these women met DSM-III-R PTSD criteria as assessed by the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon, & First 1985). Notably, the authors also reported that women who perceived greater danger to their lives had significantly higher rates of PTSD compared to those who perceived less threat. With regard to disaster related studies, Pynoos et al. (1993) examined the prevalence rates of PTSD amongst children following a major earthquake in Armenia. Independent clinical interviews based on DSM-III criteria for PTSD indicated that 78 out of the 111 trauma-exposed children that were assessed met criteria for PTSD. Additionally, the authors observed that closer proximity to the epicenter of the earthquake was associated with a more severe symptom presentation (Pynoos et al., 1988).

### **The DSM-IV and DSM-IV-TR: Posttraumatic Stress Disorder**

In 1988, the APA began efforts toward the creation of the fourth version of the DSM (DSM-IV; APA, 1994; Saigh & Bremner, 1999). The process of revision to the manual was carefully guided by comprehensive reviews of the literature, as well as field trials in the form of surveys, video-taped reliability studies, and focused field trials (Widiger, Frances, Pincus, Davis & First, 1991). Within the context of the DSM-IV, the PTSD work group revised the PTSD classification on the basis of comprehensive reviews of the available literature (Davidson & Foa, 1993), which addressed “clinical phenomenology (course, subtypes and symptomatic manifestations), epidemiology (prevalence, features and risk factors), and relation to other disorders (e.g., phobias and dissociative disorders)” (Saigh, Green & Korol, 1996, p. 112).

Additionally, multi-state and community trials were conducted with the intent of investigating potential associations between differing stressors and PTSD symptom onset and duration (Saigh, Green & Korol, 1996).

The result of these efforts led to several amendments to the existing PTSD criteria. First, changes were made to the operational definition of trauma in response to research suggesting that several stressors that have been known to lead to PTSD are common in the United States (Breslau, Davis, Andereski, & Peterson, 1991; Resnik, Kilpatrick, Dancy, Saunders, & Best, 1993; Saigh & Bremner, 1999). As such, the PTSD work group removed the existing operational definition of trauma, which stated that the traumatic event must be “outside the range of normal human experience” (APA, 1987, p. 247), and amended Criteria A to require that a person:

1. “experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others”
2. “the person’s response involved intense fear, helplessness, or horror. Note: In children it may be expressed by disorganized or agitated behavior” (APA, 1994 p. 428).

The updated manual provided specific examples of the types of direct traumatic experiences that could potentially lead to the development as PTSD. Such experiences included, but were not limited to, military combat, violent personal assaults, natural or manmade disaster, kidnappings, and automobile accidents (APA, 1994). With regard to traumatic experiences that could occur in youth, the DSM-IV specified that “sexually traumatic events [could] include developmentally inappropriate sexual experiences without threatened or actual violence” (APA, 1994, p. 424). In addition to direct traumatic experiences, the manual specified witnessing traumatic events, such as the gruesome death or injury of another person, war events, or natural disasters, as an alternative form of trauma exposure (APA, 1994). Moreover, as a result of research indicating

that the acquisition of information about a traumatic event (e.g., hearing about a violent assault) could lead to the development of PTSD (Saigh, 1991) the manual was updated to include verbal mediation as a third potential pathway towards the induction of PTSD.

Aside from updates made to the etiological requirement of the disorder, symptom criteria were also revised and adjusted. Physiological reactivity was removed from the arousal cluster (Criterion D) and moved to Criterion B (reexperiencing). The diagnostic threshold for Criterion B was adjusted such that only one of five symptoms of re-experiencing was required for a diagnosis. Two new symptom criteria, E and F were also introduced. Criterion E specified that symptoms must be present for at least one month in order for a diagnosis to be made. Lastly, Criterion F stated that symptoms must cause “clinically significant distress or impairment in social, occupational or other important areas of functioning” (Criterion E; APA, 1994 p. 424).

The updated manual included information regarding several associated features of PTSD including feelings of guilt and phobic avoidance of places or situations related to the trauma (APA, 1994). Additionally, the DSM-IV recognized that dissociative symptoms, self-destructive and impulsive behavior, and affect regulation impairments are more likely experienced by individuals whose traumatic experiences involved an adverse interaction with another person such as physical or sexual assault (APA, 1994).

With regard to the expression of PTSD in children, the manual stated that children may manifest re-experiencing symptoms in the form of frightful nightmares without recognizable content and repetitive play related to the traumatic event (APA, 1994). Additionally, the presentation of PTSD in children was said to possibly include a sense of foreshortened future, characterized by “the belief that life will be too short to include becoming an adult” (APA, 1994, p.426). While this information provided insight into the expression of PTSD symptoms in



children, it is important to note that the DSM-IV PTSD field trials did not include any subjects under the age of 15 years (Kilpatrick et al., 1993; Saigh & Bremner, 1999).

In 2000, the DSM-IV underwent a revision in which only the text of the manual was updated (DSM-IV-TR; APA). This revision did not involve changes to the diagnostic criteria. However, the revision included new information related to the course of the disorder, prevalence rates, and comorbidity rates (APA, 2000). Following the publication of the DSM-IV, several investigations examined the differential validity of the DSM-IV PTSD diagnostic criteria as related to children and adolescents.

Within the context of the differential validity of the DSM-IV PTSD classification, Saigh, Yasik, Oberfield, Halamandaris, & McHugh (2002) compared the internalizing and externalizing behaviors of 39 youth with PTSD, 59 trauma-exposed youth without PTSD and 36 non-traumatized controls. A diagnosis of PTSD according to DSM-IV criteria was established through clinical interviews and individual administrations of the Children's PTSD Inventory (Saigh, 1998). Additionally, the authors administered the Diagnostic Interview for Children and Adolescents – Revised – Parent Version (Reich, Leacock, Shanfeld, 1994) to identify and consequentially exclude youth with major comorbid disorders. In order to assess internalizing and externalizing behaviors, the parents of each participant completed the Child Behavior Check List (CBCL; Achenbach, 1991). The authors reported that the mean Internalizing, Externalizing and Total scores of the PTSD participants significantly exceeded those of the trauma-exposed PTSD negatives and the control group. Non significant differences were observed between the means of the trauma-exposed PTSD negatives and control subjects. The authors concluded that higher rates of internalizing and externalizing behaviors were associated particularly with a diagnosis of PTSD and not with trauma exposure in the absence of PTSD (Saigh et al., 2002).

In a related investigation, Saigh, Yasik, Oberfield, & Halamandaris (2007) compared the State Trait Anger Expression Inventory (STAXI; Spielberger, 1996) scores of 24 traumatized youth with PTSD, 58 trauma-exposed youth without PTSD and 38 healthy youth who served as a comparison group. The authors confirmed the presence of a PTSD diagnosis through DSM-IV based clinical interviews and individual administrations of the Children's PTSD Inventory (Saigh, 1998). The authors reported that even when controlling for covariates such as socioeconomic status, traumatized youth with PTSD demonstrated significantly higher levels of anger compared to traumatized youth without PTSD and the control group. Moreover, non significant differences in levels of self-reported anger were observed between traumatized children without PTSD and the control groups. These authors concluded that youth with PTSD were more likely to express anger quickly and without provocation (Saigh et al., 2008) relative to traumatized youth without PTSD and controls. It was also reported that trauma exposure without PTSD was not associated with increased self-reported anger.

Blom and Oberink (2012) conducted a comprehensive review of the literature pertaining to the validity of the DSM-IV PTSD criteria in children and adolescents. The authors found support for the validity of Criterion A (Exposure to trauma) amongst youth. With regard to the validity of symptom clusters, the authors found the most support for the validity of Criterion C (avoidance/numbing), followed by Criteria D (Increased Arousal) and B (Re-experiencing). The authors acknowledged that only some of the studies reviewed utilized clinical interviews to establish a diagnosis of PTSD and that the variability in methodology and subject demographics across studies limited the possibility of conclusive statements (Blom & Oberink, 2012).

Also within the context of pediatric PTSD, several investigations examined the characteristic and features of youth with PTSD. For example, Saigh, Yasik, Oberfield, and Halamandaris, and

Bremner (2006) compared the intellectual functioning of a group of 26 youth with PTSD, 57 trauma-exposed youth without PTSD and 37 youth who were never exposed to trauma. The methods utilized in this study mirror those of the previously mentioned Saigh et al. (2002, 2007) investigations. Cognitive performance was assessed through individual administrations of the Wechsler Intelligence Scale for Children, Third Edition (WISC-III; Wechsler, 1991). The authors reported that youth diagnosed with PTSD demonstrated significantly lower Full Scale and Verbal IQ scores as compared to trauma-exposed youth without PTSD and controls. At the subtest level, youth with PTSD demonstrated significantly lower scores on the Similarities (e.g., orally defining how two terms are alike), Vocabulary (e.g., orally defining a set of increasingly complex words), Comprehension (e.g., orally providing answers related to social and practical understanding), and Arithmetic (e.g. orally answering applied math problems) subtests as compared to the other two groups. These authors observed non-significant differences in cognitive performance between trauma-exposed youth without PTSD and controls. Taken together these findings suggest that trauma exposure with PTSD is associated with lower cognitive performance in the area of verbal ability. Using the same methodology, Yasik, Saigh, Oberfield, and Halamandaris (2007) compared the memory ability of a group of 29 youth with PTSD, 62 trauma-exposed youth without PTSD and a sample of 40 healthy controls. The Wide-Range Assessment of Memory and Learning (WRAML; Sheslow & Adams, 1990) was individually administered to all participants to assess visual and verbal memory, as well as learning. Results from the investigation indicated that trauma-exposed youth with PTSD demonstrated significantly lower verbal memory scores compared to trauma-exposed youth without PTSD and the control group. Additionally, the PTSD group also demonstrated lower scores on the General Memory and Learning Indices, but not on the Visual Memory Index,

compared to the other two groups. Nonsignificant differences across all indices were observed between the trauma-exposed PTSD negative youth and the control group. The results of these finding support the observation of memory impairments amongst youth with PTSD and support the observation that trauma exposure in the absence of PTSD may not be related to deficits in memory functioning (Yasik et al., 2007).

### **The DSM-5: The Most Recent PTSD Criteria**

The latest update to the DSM was finalized in 2013 with the publication of the fifth edition of the DSM (DSM-5; APA, 2013). This latest effort saw several structural changes with regard to the PTSD category, including its exclusion from its previous categorization as an anxiety disorder and its placement in the newly created Trauma-and-Stressor Related category. The new edition of the manual also included several changes to the PTSD diagnostic criteria. First, the stressor criterion (Criterion A) was defined as “exposure to actual or threatened death, serious injury, or sexual violence” (APA, 2013) through four distinct methods of exposure, including: direct exposure (Criteria A1), witnessing the traumatic event in person (Criteria A2), learning that a violent or accidental event occurred to a family member (Criteria A3) and through “repeated or extreme exposure to aversive details of the traumatic event(s)” (Criterion A4; APA, 2013, p. 271). Notably, the DSM-IV requirement that a traumatic event had to elicit an intense fear response at the time of exposure (Criterion A2) was eliminated from the DSM-5 (APA, 2003), as a result of research suggesting that PTSD may still develop even if an individual did not experience overwhelming fright during the traumatic event (Adler, Wright, Bliese, Eckford, & Hoge, 2008; O’Donnell, Creamer, Silove, & Bryant, 2003). While these findings suggest that the DSM-IV Criteria A2 may not be a significant predictor of PTSD, studies have suggested that

individuals who meet DSM-IV Criteria A2 were more likely to experience greater symptom severity (Boals and Schuettler, 2009)

Significant changes to the PTSD classification in the DSM-5 also included the expansion and reorganization of the symptoms clusters. Specifically, the re-experiencing cluster (Criterion B) was relabeled to reflect “intrusion symptoms” (APA, 2013). Notably, the DSM-IV avoidance/numbing cluster was divided into two distinct symptoms clusters, one denoting two symptoms related to effortful avoidance (Criterion C), and the other encompassing seven symptoms related to the negative alteration of cognitions and mood (Criterion D). Within Criterion D, three new symptoms were introduced: “persistent and exaggerated negative beliefs or expectations about oneself, others, or the world”, “persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others” and “persistent negative emotional state (e.g., fear, horror, anger, guilt or shame)” (APA, 2013, p. 272). The DSM-IV symptoms cluster for “persistent symptoms of increased arousal” (APA, 2000, p. 468) was relabeled in the DSM-5 as “marked alterations in arousal and reactivity” (Criterion E; APA, 2013, p. 272) and was expanded to include symptoms of “reckless and self-destructive behaviors” (APA, 2013, p. 272). While the DSM-5 retained the same requirements in terms of symptoms duration (e.g., at least one month) and severity (DSM-IV Criterion F), a new criterion was added to specify that “the disturbance is not attributable to the physiological effects of a substance (e.g., medication, alcohol) or another medical condition” (APA, 2013, p. 272).

With regard to specifiers related to the PTSD classification, the DSM-IV delayed onset specifier, which required symptom onset to occur at least six months after the traumatic event, was amended in the DSM-5 to require that “the full diagnostic criteria are not met until at least

six months after the event (although the onset and expression of some symptoms may be immediate)” (APA, 2013, p. 272). Additionally, the DSM-5 included specifiers related to dissociative symptoms of either depersonalization (e.g., feeling detached from one’s mental processes or body) or derealization (e.g., experiencing one’s surroundings as unreal and dream-like).

The DSM-5 PTSD criteria also included a new set of symptom criteria specifically for children six years and younger. For this age group, the traumatic stressors category (Criterion A) indicates that the traumatic experiencing can be experienced directly or by observation. Verbal mediation was also recognized, but only if the traumatic experience involved parents or caregiving figures (APA, 2013). While the preschool criteria for PTSD retains many of the same symptoms as the adult criteria, several structural differences are apparent. Specifically, the preschool criteria is based on a three factor statistical model as compared to a four factor model utilized in the adult criteria. Symptoms of avoidance (Adult Cluster C) and negative alterations in cognitions and mood (Adult Cluster D) are combined in the preschool subtype. Additionally, the “reckless and self-destructive behavior” (APA, 2013, p. 272) symptom present in the adult “alterations in arousal and reactivity” cluster is absent in the preschool subtype.

The removal of the PTSD diagnostic classification from its larger classification as an anxiety disorder has been the source of much debate within the scientific community. Proponents of the change argue that while commonly present in PTSD, fear and anxiety are not central to the development and maintenance of the disorder (for a review of these arguments see Resick & Miller, 2009). These views have been met with substantial opposition from researchers who claim that arguments that favor the removal of PTSD from the category of anxiety disorders lack empirical evidence and undermine the role of anxiety and fear within PTSD (Zollner, Rothbaum,

& Feeny, 2011). Specifically, Zollner and colleagues (2011) put forth four arguments to challenge to movement of PTSD to the category of “trauma and stress related disorders”. The first argument asserts that years of research suggests that “...of all the anxiety disorders, PTSD consistently shows an empirical pattern (i.e. stronger, more consistent evidence than panic disorder, social anxiety disorder) of anxiety disorder-defining characteristics” (p. 853). Secondly, the authors argue that exposure therapy, which the authors identify as the most empirically supported treatment for PTSD, relies on the same principles of conditioning and extinction used in the conceptualization and treatment of other anxiety disorders, providing support for the neurobiological relatedness of PTSD to anxiety disorders such as specific phobias. The third argument points to the dearth of empirical evidence from factor analysis studies indicating that PTSD loads on its own separate construct. Lastly, the authors provide an argument against the expansion of the PTSD symptoms clusters in the DSM-5, suggesting that this expansion will lead to significant increases in the heterogeneity of the disorder, resulting in a diluted focus of the underlying similarities between diagnostic presentations of PTSD (Zollner et.al, 2011). At the time of this investigation, the practical utility of the changes set forth by the DSM-5 PTSD criteria were still unknown, especially given the significant changes from the DSM-IV criteria, which remain a topic of ongoing controversy in the scientific trauma literature.

### **Chapter Summary**

Historical accounts dating as early as 1300 B.C. provide us with insight into humanity’s early recognition of the significant relationship between exposure to overwhelming stress and adverse psychological and physiological reactions. Beginning in the nineteenth century, the medical literature attempted to define clusters of posttraumatic reactions through several terms such as “Da Costa’s syndrome”, “traumatic neuroses”, and “shell shock”. Trends in trauma

research led to the proliferation of terminology used to describe analogous psychological and physiological stress reactions, which ultimately impeded scientific progress both in terms of practice and research (Saigh, 1992a). Early efforts to arrive at a unified nosology of posttraumatic reactions began with the introduction of the term Gross Stress Reaction in the first edition of the American Psychiatric Association's Diagnostic and Statistical Manual (APA, 1952). Sixteen years later, the second edition of the DSM introduced the term Transient Situational Disturbance (APA, 1967). While these diagnostic entities suffered from the lack of operationalized criteria, they laid the groundwork for the introduction of Posttraumatic Stress Disorder in the third edition of the DSM (APA, 1980). This latest diagnostic classification benefitted from clearly defined symptom descriptions and included detailed information necessary to formulate a diagnosis. Over the years, refinements to the PTSD criteria were guided by extensive literature reviews and field trials. Efforts were made to expand the PTSD classification to include information regarding the manifestation of symptoms in youth, although field trials involving subjects younger than 15 were not conducted until recently.

With the publication of the DSM5, the PTSD diagnostic classification underwent several major conceptual changes, including the controversial removal of PTSD from its long-standing classification as an anxiety disorder.



## **Chapter II**

### **THE EPIDEMIOLOGY OF CHILD AND ADOLESCENT PTSD**

Epidemiology refers to the branch of scientific study devoted to “estimating and describing the prevalence and distribution of health and illness in the population” (Norris & Slone, 2007, p. 78). The scope of epidemiological research is to acquire information relative to the frequency, severity, causes, and risk factors of health-related phenomenon (Van den Broeck & Brestoff, 2013). Findings generated from epidemiological studies are critical in guiding the design, implementation and evaluation of interventions aimed at preventing or treating various disorders and diseases. Given the importance of epidemiological research, the current chapter will focus on reviewing the existing literature pertaining to the epidemiology of PTSD in various populations of children and adolescents. After a review of the literature pertaining to the prevalence of trauma exposure and PTSD among youth, the current chapter will present findings relative to the incidence of PTSD among children and adolescents exposed to specific stressors such as war-related traumas, criminal victimization, and natural disasters. The chapter will also examine risk factors for trauma exposure and PTSD, as well as rates of comorbidity between PTSD and other mental health disorders.

Studies presented in this review were acquired through electronic searches conducted on the PILOTS, PsychINFO, Pubmed, and Medline databases. Search terms included “posttraumatic stress disorder,” “PTSD,” “child and adolescent” and “youth”. To identify relevant epidemiological studies relating to the development of child and adolescent PTSD following specific stressors, the following secondary search terms were included: “epidemiology,” “war,” “terrorist attack,” “school shooting,” “natural disaster,” “earthquake,” “tornado,” “hurricane,” “fire,” “criminal victimization,” “sexual assault,” “physical assault,” “rape,” “violent,” “injury,”

and “motor vehicle accident.” In order to examine the prevalence of PTSD among youth, studies were selected with participants who were between the ages of two and 24 years and had a PTSD diagnosis that was made through an administration of a reliable and valid DSM based clinician-administered diagnostic interview. As such, studies that utilized versions of the following instruments were considered: the Anxiety Disorder Interview Schedule for DSM (ADISC-C; Silverman & Albano, 1996); the Children’s PTSD Inventory (CPTSDI; Saigh, 1987, 1989, 1998, 2003a, 2003b); the Composite International Diagnostic Interview (CIDI; World Health Organization, 1997a, 1997b); the Clinician Administered PTSD Scale for Children and Adolescents (CAPS-CA; Nader et al., 1997); the Diagnostic Interview Schedules for Children and Adolescents (DICA; Herjanic & Reich, 1982; Kaplan & Reich, 199; Reich & Welner, 1988); the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule (DIS; Robins, Helzer, & Croughan, 1981); the National Women’s Survey (NWS) PTSD Module (Kilpatrick, Resnick, Saunders, & Best, 1989); the Posttraumatic Stress Disorder Interview (PTSD-I; Watson, Juba, Manifold, Kucala, & Anderson, 1991); the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Kaufman, Birmaher, Brent, Ryan, & Rao, 2000; Puig-Antich, 1983 ); and the Structured Clinical Interview for DSM (SCID; First, Gibbon, Williams, & Spitzer, 1996).

Additionally, articles obtained from the reference lists of book chapters by Saigh (1992a) and Saigh et al. (1996) were considered for inclusion.

## **Trauma Exposure and PTSD Prevalence Rates Among Adults**

### **U.S. General Population**

Trauma research conducted over the past twenty years has demonstrated that exposure to traumatic events is common. (Breslau, Davis, Andreski, & Peterson, 1991; Breslau et al., 1998;

Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris; 1992). Results from The National Comorbidity Survey (NCS) conducted by Kessler and colleagues (1995) indicated that 60.7% of men and 51.2% of women in the United States experienced at least one traumatic event. Based on assessments completed using a modified version of the Composite International Diagnostic Interview (CIDI; World Health Organization [WHO], 1990), the authors reported a PTSD prevalence rate of 7.8% among a nationally representative adult sample. In a replication of the NCS conducted a decade later, Kessler et al. (2005) reported a lifetime PTSD prevalence rate of 8.7%. In the same vein, a recent national survey conducted by Kilpatrick and colleagues (2013) investigated the prevalence rates of exposure to trauma as defined by the DSM-5 (APA, 2013) criteria. The authors electronically administered the National Stressful Events Survey (Kilpatrick, Resnick, Baber, Guille, & Gros, 2011) to a nationally representative sample of 2,953 adults. Of these, 89.7% reported exposure to at least one traumatic event. In a review of the existing epidemiological research, Norris and Slone (2013) concluded that 25% of the general population will experience a traumatic event by adulthood and that most individuals will experience one or more traumatic events by the age of 45.

### **U.S. Community Samples**

The prevalence of trauma exposure among community residents in the United States is estimated to be 80% (Breslau, 2009). Results from a telephone survey of 4,008 U.S. women indicated that 69% of participants reported exposure to at least one traumatic event in their lifetime (Resnick et al., 1993). As based on administrations of the National Women's Study PTSD Module (Kilpatrick et al., 1989), the authors estimated a lifetime PTSD prevalence rate of 12.3%. In a community survey of 2,181 adults living in the Detroit area, Breslau and colleagues (1998) reported that approximately 89.6% of the participants experienced at least one traumatic

event. A lifetime PTSD prevalence rate of 9.2% was reported based on individual administrations of the Diagnostic Interview Schedule, Version IV (DIS-V; Robins et al., 1995).

### **International Populations**

The prevalence of PTSD has also been surveyed in non-U.S populations. Relative to prevalence rates reported in the United States, data collected as part of The World Mental Health Survey Initiative (Kessler & Ustun, 2008) indicated lower rates of lifetime PTSD in 27 surveyed countries. Specifically, lifetime PTSD prevalence, as measured by the Composite International Diagnostic Interview, Version 3.0 (WHO, 1997), ranged from zero lifetime cases reported in Nigeria to a prevalence rate of 4.6% reported in Ukraine. In a similar international survey conducted on a sample of 8,797 adult European citizens, Darves-Bornoz et al. (2008) reported that 63.3% of the total sample experienced a traumatic event in their lives. PTSD prevalence rates were established through administrations of the WHO Composite International Diagnostic Interview-2000 (CIDI-2000; Girolamo & Bassi, 2003) and were reported to be 0.56% in Spain, 0.68% in Germany, 0.73% in Italy, 0.76% in Belgium, 2.32% in France, and 2.63% in the Netherlands.

In the Oceanic continent, Creamer, Burgess and McFarlane (2001) assessed the prevalence of trauma exposure and PTSD among a nationally representative sample of 10,641 adult Australian citizens. The authors reported that 64.6% of males and 49.5% of females experienced at least one traumatic event in their lives. Using a modified version of the CIDI (Andrews & Peters, 1998), the authors observed a 12-month PTSD prevalence rate of 1.33%.

In a multi-national epidemiological survey, Joop and colleagues (2001) assessed survivors of war and acts of mass violence from four low-income, post-conflict nations including Cambodia ( $n = 610$ ), Algeria ( $n = 653$ ), Ethiopia ( $n = 1\ 200$ ) and Gaza ( $n = 585$ ). Participants

were assessed for trauma exposure and PTSD using the CIDI - Version 2.1 (WHO, 1997b). Results indicated varying rates of trauma exposure among survivors. Specifically, Cambodian respondents reported the highest frequency of separation from family (17.5%), while respondents from Ethiopia reported the highest levels of exposure to torture (25.5%). In Algeria, 91.9% of respondents reported experiencing conflict-related traumatic events after the age of 12, while relatively lower rates of exposure to conflict-related events were reported in Cambodia (74.4%), Ethiopia (78%) and Gaza (59.3%). Lifetime PTSD prevalence rates were reported at 15.8% in Ethiopia, 17.8% in Gaza, 28.4% in Cambodia and 37.4% in Cambodia.

### **Trauma Exposure and PTSD Prevalence Rates Among Children and Adolescents**

Results from large-scale national surveys reports conducted by U.S. government agencies clearly suggest that children and adolescents are commonly exposed to potentially traumatic events. For example, statistics reported by the Department of Justice (2014) indicated that in 2103, youth between the ages of 12 and 17 had the highest prevalence of criminal victimization relative to all other age groups. According to data collected from the U.S. Department of Health and Human Services (2014), approximately 679,000 children were reportedly victims of child abuse and neglect in 2014. Results from the National Survey of Children's Exposure to Violence (Finkelhor, 2013), a national telephone survey conducted with the caregivers of 4503 children in the United States, indicated that in the year prior to the survey, 41.2% of children in the sample experienced physical assault by an unknown adult (5.0%), a sibling (20.7%), a peer (17.9%) or by a group (1.7%). One in ten children reportedly suffered physical injuries as a result of the assault. Additionally, 5.6% of the total sample reported sexual victimization in the form of attempted or completed rape or sexual assault. Finally, the authors reported that 13.8% children experienced maltreatment by their caregiver, including physical (3.7%) and sexual abuse (0.1%)

and neglect (6.5%). With regard to motor vehicle incidents, the U.S. Department of Transportation (2010) issued a report indicating that approximately three million children ages seven years or younger were involved in motor vehicle crashes between 1999 and 2008.

### **U.S. General Population**

While epidemiological research on trauma exposure and PTSD among children and adolescents in the general population is limited, the existing data suggests that youth experience a disproportionate amount of traumatic events. Results from the National Comorbidity Survey (Kessler et al., 1995), indicated that 60.7% of male and 51.2% of female participants between the ages of 15 and 24 experienced one or more traumatic events in their lifetime. Using the DSM-III (APA, 1980) based version of the CIDI (WHO; 1997a), the authors reported PTSD prevalence rates of 10.3% for females and 2.8% for males in this age group. Analogously, Boney-McCoy and Finkelhor (1995) investigated the prevalence of violent assault within a nationally representative sample of 2,000 children and adolescents between the ages of ten and 16. The authors reported that 35.1% of youth in the sample experienced a completed victimization in their lifetime. Among male youth ( $n = 1,042$ ), aggravated assault by a non-family member was the most reported form of victimization (18.4%). Meanwhile, female participants ( $n = 1,402$ ) reported the highest prevalence of sexual assault (15.3%).

In a similar investigation, Costello, Erkanli, Fairbank and Angold (2002) conducted a longitudinal study examining the prevalence of traumatic events from childhood to adolescence among a sample of 1,402 youth in rural North Carolina. Using the DSM-IV based Life Events Interview (Angold & Fisher, 1999) the authors reported that 25% of participating youth reported an extreme stressor (e.g., medical trauma, sexual abuse, serious accident, traumatic loss of a

significant other). Of these, 72% reported just one event, 18% reported experiencing two events and the remaining 10% reported experiencing three or more events.

The National Survey of Adolescents (NSA; Kilpatrick & Saunders, 1997), documented the prevalence rates of trauma exposure and PTSD among a nationally representative sample of 4,023 adolescents between the ages of 12 and 17. With regard to trauma exposure, 8.1% of youth in the sample reported at least one account of sexual assault, while 17.4% reported being physically assaulted at least once in their lifetime. Of those who reported experiencing physical assault, 52.4% feared they would be seriously injured or killed. Exposure to physically abusive punishment was reported by 9.4% of participants in the sample. Lastly, 39.4% of participants reported witnessing at least once serious violent event in their lifetime. Using the same data, Kilpatrick et al. (2003) assessed the prevalence of PTSD using the DSM-IV (APA, 1994) based National Women's Survey (NWS) PTSD module (Resnick et al., 1993). PTSD prevalence rates were reported at 3.7% for male youth and 6.3% for female youth.

Finally, using data from The National Comorbidity Survey-Adolescent Survey Replication (NCS-ASR; Kessler et al., 2009), Merikangas and colleagues (2010) examined the prevalence rates of PTSD within a sample of 10,123 adolescents between the ages of 13 and 17 living in the United States. Using a modified version of the CIDI (Merikangas et al., 2009), the authors reported a PTSD prevalence rates of 4.7% for the total sample. Prevalence rates by age groups were reported at 3.7% for participants between the ages of 13-14, 5.1% for youth ages 15-16, and 7.0% for youth ages 17-18.

### **U.S. Community Studies**

In addition to government statistics and epidemiological research pertaining to the general population, several community-based studies have surveyed the prevalence of trauma

exposure and PTSD among youth in the United States. For example, Giaconia et al. (1995) examined the prevalence of PTSD in a survey of 384, 18-year-old adolescents from the northeast region of the United States. The prevalence of PTSD was assessed through individual administrations of the DSM-III-R (APA, 1987) based National Institute of Mental Health (NIMH) Diagnostic Interview Schedule, Version III-R (DIS-III-R; Robins, Helzer, Cottler, & Golding, 1989). The authors reported that 43% of the adolescents in the sample experienced at least one type of traumatic event in their lifetime. Of these, 12.2% experienced a traumatic event before the age of 10, while 26.87% experienced a traumatic event by age 14. PTSD prevalence was reported at 6.3% for the overall sample.

In a similar investigation, Cuffe et al. (1998) documented the prevalence of trauma exposure and PTSD in a community survey of 490 older adolescents (age range: 16-22) from a single school district in South Carolina. Within this sample, 80 students (16.3%) reported experiencing at least one traumatic event including rape/sexual assault, life-threatening medical conditions, criminal victimization and physical injury. Based on administrations of the Schedule for Affective Disorders and Schizophrenia for School-Aged Children (K-SADS; Chambers et al., 1985), 3% of female and 1% of male participants met full DSM-IV (APA, 1994) criteria for PTSD.

Also using DSM-IV criteria (APA, 1994), Breslau et al. (2004) evaluated the occurrence of trauma exposure and PTSD within the context of a longitudinal study that assessed a cohort of youth during childhood and again in early adulthood. The epidemiological sample consisted of 2,311 six-year old children selected from a public school district in a large mid-Atlantic city in the United States. Of these, 1,698 participants were assessed for trauma exposure and PTSD approximately 15 years after baseline assessment. Trauma exposure and PTSD were assessed



through individual administrations of the PTSD module from the CIDI, Version 2.1 (WHO; 1997a). Results of the study indicated that 82.5% of the total sample experienced at least one traumatic event in their lifetime. Of these, 59.9% were exposed to four or more traumas and only 15.8% experienced a single traumatic experience. Learning of a traumatic event that occurred to a close friend or relative was the most reported traumatic event (27.3%), followed by other injury or shocking event (e.g., car accident, natural disaster; 26.4%), assaultive violence (e.g., rape, mugging; 25.8%), and learning about unexpected death (20.4%). The majority of traumatic events were reported to have occurred between the ages of 15 and 19. The lifetime PTSD prevalence rate for the overall sample was 8.8%.

In another longitudinal study using DSM-IV-R (APA, 2000) criteria, Breslau, Lucia and Alvarado (2006) assessed a cohort of 713, 17 year-old adolescents sampled from two socioeconomically diverse backgrounds. Trauma exposure and PTSD were assessed using the NIMH Diagnostic Interview Schedule, Version III-R (DIS-III-R; Robins et al., 1989). A majority of the participants (75.88%) reported having experienced at least one traumatic event by age 17. Approximately one quarter of the surveyed youth reported having experienced a violent attack, including sexual assault (5.33%), mugging (15.85%), kidnapping (5.3%), bullet or knife wounds (3.23%) and serious physical assault leading to injury (6.45%). Of the 713 adolescents, 8.3% met diagnostic criteria for PTSD. Additionally, the authors reported that adolescents from suburban communities were at lower risk for PTSD relative to youth from urban communities.

Taken together, the reviewed community studies conducted in the United States reported prevalence rates of trauma exposure that ranged from 16.3% to 82.5%. Meanwhile, PTSD prevalence rates ranged from 1% to 8.8%. This data suggests that while exposure to traumatic

events was common among children and adolescents in community samples, only a relatively small percentage of trauma-exposed youth developed PTSD.

### **Trauma Exposure and PTSD among Non-U.S. Youth**

Several studies have documented the prevalence of trauma exposure and PTSD among youth outside of the United States. Using data acquired from the Early Stages Developmental Psychopathology, Perkonigg and colleagues (2000) examined the instance of trauma exposure and PTSD among a community sample of 3,021 adolescents and young adults (age range: 14-24) in Munich, Germany. Using DSM-IV (APA, 1994) criteria, the authors assessed for PTSD using individual administrations of the Munich CIDI (Wittchen, Nelson, Lachner, 1998). On the basis of these administrations, 25% of males and 17.7% of females reported having experienced a traumatic event in their lifetime; however, only 17% of the total sample met DSM-IV (APA, 1994) PTSD Criteria A1 by additionally reporting that the traumatic event coincided with feelings of fear, horror and hopelessness. A PTSD prevalence rate of 7.8% was reported for those participants who endorsed a qualifying traumatic event.

A number of epidemiological studies applied identical methodology and instruments to document rates of trauma exposure and probable PTSD in general population and community samples across several countries in Europe and Africa (Bodvarsdottir & Elkit, 2007; Elklit, 2002; Karsberg, Lasgaard & Elklit, 2012; Petersen, Elklit, Olesen, 2010). Collectively, these studies reported trauma exposure prevalence rates of 86% among Greenlandic youth ( $n = 296$ ; mean age = 15.4; Karsberg & Lasgaard, 2007); 90% among Faroese youth ( $n = 687$ ; mean age = 14.2; Petersen, Elklit, Olesen, 2010); 82.5% among Danish youth ( $n = 390$ ; mean age: 14.5; Elklit, 2002); 76.5% among Icelandic youth ( $n = 206$ ; mean age: 14.5; Bodvarsdottir & Elkit, 2007), and 94% among youth living in rural Kenya ( $n = 477$ ; mean age = 16.4; Karsberg, Lasgaard &

Elklit, 2012). Using DSM-IV criteria, each study assessed for a diagnosis of probable PTSD using the Harvard Trauma Questionnaire, Part IV (HTQ; Mollica et al., 1992). The prevalence rates of probable PTSD were reported at 17% in the Greenlandic youth sample; 20% in the Faroese youth sample; 9% in the Danish youth sample; 16% in the Icelandic youth sample, and 34.5% among the sample of rural Kenyan youth.

### **Trauma Exposure and PTSD Among Incarcerated Youth**

Research studies suggest that incarcerated youth experience a high frequency of exposure to violence. For example, Erwin et al. (2000) administered the Exposure to Community Violence Scale – Adopted Version (Richters, 1990), and the Clinician Administered PTSD Scale for Children and Adolescents (CAPS-CA; Nader et al., 1997) to a sample of 51 incarcerated adolescents (mean age = 17.5) from a high-security correctional facility in Massachusetts. While the vast majority of adolescents reported experiencing at least one potentially traumatic event in their lifetime, not all participants reported experiencing associated feelings of fear or horror, thus not fully meeting DSM-IV (APA, 1994) PTSD Criteria A2. Considering only participants who met both Criteria A1 and A2, 41% reported witnessing a homicide and 26% reported seeing someone die. Physical assault within the family was reported by 31% of the sample, while another 31% reported being in a serious accident. Approximately 22% of youth reported sexual assault by a non-family member. The authors reported a PTSD prevalence rate of 18% for the overall sample of incarcerated youth.

In a larger study, Abram et al. (2004) examined the prevalence of trauma exposure and 12-month PTSD diagnosis within a sample of 1,829 male and female incarcerated youth. Each participant was evaluated for trauma exposure and PTSD during individual administrations of the DSM-IV based Diagnostic Interview Schedule for Children, Fourth Edition (DISC-IV; Shaffer,

2003). Ninety-two percent of respondents experienced at least one trauma and 84% reported multiple traumas. The average number of traumas reported by incarcerated youth was 14.6. Traumatic experiences were more frequently reported by males (93.2%) relative to females (84%) and by those 14 years and older. Among the reported traumatic events, 74.9% of males and 63.5% of females witnessed someone else being badly injured or killed. Meanwhile, 59.3% of males and 47.6% of females reported being threatened with a weapon. Of those who reported experiencing a traumatic event, 11.2% met 12-month diagnostic criteria for PTSD.

### **Trauma Exposure and PTSD Among Lesbian, Gay Bisexual & Transgender (LGBT)**

#### **Youth**

Youth who identify as LGBT are at an increased risk for victimization. The 2011 National School Climate Survey (Kosciw, Greytak, Bartkiewicz, Boesen & Palmer, 2012) reported that among a sample of 8,584 students who identified as LGBT, 21.2% of students were physically assaulted because of their sexual orientation and gender expression. Within this context, Mustanski, Garofalo and Emerson (2010) examined the prevalence of psychiatric illness within a community sample of 246 LGBT youth between the ages of 16 and 20. Using the DSM-IV (APA, 1994) version of the DISC-IV (Shaffer, 2003) the authors reported a 12-month PTSD prevalence rate of 9.3% for the overall sample. Similarly, D'Augelli, Grossman and Starks (2006) examined the prevalence of lifetime victimization based on gender identity and PTSD among a sample of 528 lesbian, gay and bi-sexual youth (mean age =17) from New York City and the tristate area. PTSD status was assessed using the DISC-IV (Schaffer, 2003). Results from the study indicated that 11% of the sample reported physical victimization based on sexual orientation, while 9% of the sample reported being sexually assaulted after disclosing their

sexual orientation to another person. Of the participants who experienced a traumatic event, 9% met criteria for PTSD.

### **Prevalence of PTSD by Stressor Type**

The following section presents results from epidemiological research on the prevalence of child and adolescent PTSD following specific type of stressors including criminal victimization, war-related stressors, natural disasters and accidents.

#### **Criminal Victimization Studies**

Data from government surveys cited earlier in this chapter suggest that children and adolescents in the United States are among the most frequently exposed to criminal victimization relative to other age groups. Several epidemiological studies have investigated the prevalence of PTSD among child and adolescent victims of physical and sexual victimization, exposure to community violence and school shootings. For example, Merry & Andrews (1996) sought to determine the psychiatric status of 66 children twelve months after the children disclosed recent sexual abuse. Participants between the ages of six and 16 were recruited from social service agencies excluding psychiatric facilities. All youth were exposed to an array of sexually abusive acts both within and outside of their families. PTSD symptoms were assessed through administrations of the DSM-III (APA, 1980) based DISC, Second Edition (DISC-2; Shaffer et al., 1989). The authors reported that 18.9% of youth who had been raped or sexually abused met diagnostic criteria for PTSD.

In a related study, McLeer et al. (1993) compared the prevalence of psychiatric disorders between a clinical sample of sexually abused youth ( $n = 26$ ) and a matched sample of non-sexually abused youth referred for outpatient evaluation ( $n = 23$ ). PTSD and other psychiatric disorders were assessed by individual administrations of the DSM-III-R (1987) based version of

The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiological Version (K-SADS-E; Orvaschel et al., 1982). Results indicated that while the sexually abused group did not differ from the non-sexually abused group in terms of the number of psychiatric disorders diagnosed, the prevalence of PTSD among the group of sexually abused children was significantly higher compared to the non-sexually abused children. Specifically, 42.3% of sexually abused children met criteria for PTSD.

Famularo et al. (1994) examined the prevalence of PTSD among 109 parent-child dyads. Child participants were between the ages of two and 12 years and were exposed to maltreatment of a severity sufficient to warrant legal action and removal from parental custody. Maltreated children were assessed for PTSD through individual administrations of the Diagnostic and Interview for Children and Adolescents (DICA; Reich & Welner 1990). Meanwhile, mothers and caregivers were assessed using the Posttraumatic Stress Module of the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon, & First, 1989). The authors reported that 35.8% of maltreated children met PTSD criteria at the time of the study. Linning & Kearney (2004) examined 55 maltreated youth living in homeless shelters. Participants were between the ages of eight and 17 years (mean age: 12.65 years) and were recruited from shelter care facilities in Nevada and Idaho that provide care to youth who have been maltreated within the past two years. All participants were assessed for PTSD using the Children's PTSD Inventory (CPTSDI; Saigh, 2003). The authors reported that 67.3% of maltreated youth in the sample met DSM-IV criteria for PTSD.

In a more recent investigation, Broman-Fulks et al. (2007) examined data from 321 sexually victimized adolescents who participated in the National Survey of Adolescents (NSA). Specifically, the authors assessed whether sexual assault disclosure within one month of the

assault impacted rates of psychopathology, including PTSD. The sample consisted of 251 girls and 70 boys with a mean age of 15.2 years. PTSD was assessed using a modified version of the DSM-IV based NWS PTSD Module (Kilpatrick et al., 1989). The authors reported a six-month PTSD prevalence rate of 22% among adolescents who disclosed sexual abuse within one month, 13% among those who disclosed after one month and 24% among those who did not disclose at all. No significant difference in PTSD prevalence was reported between the three groups.

Ackerman, Newton, McPherson, Jones and Dykman (1998) conducted a study aimed at comparing rates of PTSD and other psychiatric disorders between three groups of children who were either sexually abused ( $n = 127$ ), physically abused ( $n = 43$ ) or both ( $n = 34$ ). Participating youth were between the ages of seven and 12 years and were recruited from local agencies in Arkansas. Individual administrations of the DSM-III (APA, 1980) based DICA (Reich & Welner, 1988) to both victims and their parents were used to assess PTSD and other disorders. Higher PTSD prevalence rates were reported among youth who experienced both physical and sexual assault (54.9%), compared to children who solely experienced sexual abuse (31.8%) or physical abuse (25.4%).

In the same vein, Wechsler-Zimring and Kearney (2011) compared the prevalence of PTSD between a group of 84 U.S. adolescents who experienced neglect only ( $n = 33$ ), physical and/or sexual maltreatment only ( $n = 20$ ) or neglect with physical and or sexual maltreatment ( $n = 21$ ). Participants between the ages of 11 and 17 were recruited through a facility for maltreated youth in Nevada. Individual assessments using the Children's PTSD Inventory (CPTSDI; Saigh, 2003) indicated a PTSD prevalence of 89.3% for the total sample. Although the three groups did not significantly differ in terms of PTSD prevalence, the authors reported that adolescents in the

neglect only group endorsed lower CPTSDI significant distress scores relative to the other two groups.

In a similar investigation, Silva and colleagues (2000) examined 59 youth between the ages of three and 18 years who experienced either sexual abuse, physical abuse or after witnessed domestic violence. Assessments using the youth version of the Structured Clinical Interview for DSM-IV Disorders (KID-SCID; Matzner, Silva, Chowdury, & Natasi, 1997) indicated that 22% of participants in the overall sample met PTSD criteria. Specifically, 21% of physically abused children met criteria for PTSD, while 15% of sexually abused children also developed PTSD. Of the youth who witnessed domestic violence, 17% developed PTSD.

In the previously cited Breslau et al. (2004) study, 304 of 1,698 adolescents from an urban public school system in the United States were victims of assaultive violence. Of these, 15.1% met criteria for PTSD. Specifically, 46.2% of the 39 adolescents who reported being victims of rape met criteria for PTSD. Additionally, of the 38 adolescents who reported sexual assault other than rape, 29% met PTSD criteria. With regard to non-sexual violence, 123 adolescents reported being mugged and/or threatened with a weapon and 4.1% met PTSD criteria. PTSD prevalence rates were reported at 20% for those adolescents who reported being tortured ( $n = 10$ ); 9.4% for adolescents who were shot or stabbed ( $n = 64$ ); 4.1% for those who were mugged/threatened with a weapon ( $n = 123$ ) and 13.3% for those who reported being badly beaten ( $n = 30$ ).

Luthra et al. (2009) examined 157 youth between the ages of eight and 17 years referred to a New York City mental health clinic. Individual assessments using the K-SADS (Kaufman et al., 1997) indicated that 45% of the sample experienced at least one traumatic event according to DSM-IV Criteria A1. The authors reported that 19% of the sample met full PTSD diagnostic



criteria. Notably, interpersonal traumas such as physical abuse, sexual abuse and witnessing domestic violence were significantly more likely to lead to the development of PTSD compared to non-interpersonal events (e.g., fires, car accidents).

In order to examine the prevalence of PTSD among adolescent homicide survivors in the United States, Rheingold, Zinzow, Hawkins, Saunders, and Kilpatrick (2012) examined data from 3,614 adolescent participants in the National Survey of Adolescents Replication Study (Kessler et al., 2005b). Of these, 18% reported having survived a homicide attempt, while 7% reported surviving a vehicular homicide and 2% reported surviving both. PTSD prevalence rates among homicide survivors were established through individual administrations of the DSM-IV (APA, 1994) based NWS PTSD module (Kilpatrick et al., 1989). The authors reported a 6-month PTSD prevalence rate of 6% among homicide survivors, and 7% among vehicular survivors. Additionally, 9% of adolescents who reported surviving both forms of homicide met PTSD criteria. Notably, the authors reported that homicide survivorship did not predict a PTSD diagnosis in a statistical model that also considered past exposure to violence; hence, the variance of PTSD symptoms among homicide survivors may be better accounted by repeated exposure to community violence.

Regarding children who were exposed to school shootings, Vila, Porche, Luc-Michen & Mouren Simeoni (1999) evaluated a class of 26 French youth (age range: 6-9) held hostage by an armed man with a gun for two hours. The intruder, an individual later identified as mentally ill, personally threatened the 26 children and the teacher. Additionally, during a brief electrical failure he began shouting and many children feared he would shoot them. The man eventually surrendered to law enforcement without physically hurting any of the hostages. The 26 directly-exposed children were evaluated for PTSD using a French version of the K-SADS (Puig-Antich

et al., 1980) two, four, seven and 18 months after they were held hostage. A separate group of 22 children from the same school who were not held hostage was used as a control group. The authors reported that two months after the incident, seven of the 26 (27%) directly-exposed children met full DSM-IV (APA, 1004) PTSD criteria. At 18 months, only one directly-exposed child still met full PTSD criteria. With regard to the indirectly exposed group, two children (9%) developed PTSD immediately after the event and one child (4.5%) developed the disorder six-months after the event.

As may be seen from Table 1.1, the literature that was reviewed pertaining to the prevalence of PTSD among criminally victimized youth indicates that PTSD point prevalence rates ranged from 2% to 89.3%.

Table 1.1

*PTSD Prevalence Rates in Children and Adolescents Following Criminal Victimization*

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
Ackerman, Newton, McPherson, Jones & Dykman (1998)	73 males 131 females	Age Range: 7-13 years	DICA-R	More than 4 weeks	Only Sexual Abuse: 31.8% Only Physical Abuse: 25.40% Both: 51.90% Total Sample: 34.00%
Breslau et al. (2004)	1,698 adolescents	Age Range: 21 years	CIDI 2.1	Not Reported	15.1%
Broman-Fulks et al. (2007)	70 males 251 females	Mean Age: 15.2 years	NWS	Not Reported	Non-Discloser Group: 24% Short-Delay Disclosers Group: 22% Long-Delay Disclosers Group: 13%

Table 1.1 Continued

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
Famularo et al. (1996)	48 males 69 females	Age Range: 6-12 years	DICA-C-R	Not Reported	35.8%
Linning & Kearney (2004)	22 males 33 females	Age Range: 8 – 17 years	CPTSDI	2 years	67.3%
Luthra et al. (2009)	91 males 66 females	Age Range: 8-17 Mean Age:	K-SADS	Not Reported	19%
Merry & Andrews (1987)	11 males 55 females	Mean Age: 8 years Age Range: 6-16	DISC	12 months	18.9%
Mcleer, Callaghan, Henry & Wallen (1993)	96 children	Age Range: 6-16 years	K-SADS-E	Not Reported	42.3%

Table 1.1 Continued

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
Rheingold, Zinzow, Hawkins, Saunders, and Kilpatrick (2012)	3,614 adolescents	Age Range: 12-17 years	NWS	Not Reported	Homicide Survivors: 6.00% Vehicular Homicide Survivors: 7.00% Both: 9%
Silva, Alpert, Munoz, Singh, Matzner & Dummit (2000)	39 males 20 females	Mean Age: 9.9	Kid-SCID	Not Reported	Domestic Violence: 17% Sexual Abuse: 21.00% Witnessed Domestic Violence: 17.00% Total Sample: 22%
Vila, Porche, & Mouren-Simeoni (1999)	14 males 12 females	Age Range: 6-9.5	K-SADS-L	Initial: 2 months Follow-up: 18 months	Initial: 27% Follow-up: 3.84%
Wechsler-Zimring & Kearney (2011)	37 male 46 female	Age Range: 11-17 years Mean Age: 14.5 years	CPTSDI	Not Reported	89.3%

## **War-Related Studies**

Several epidemiological studies have investigated the prevalence of PTSD among youth exposed to war related stressors. These studies offer important insight into the psychological sequelae of youth following traumas such as bombings, air raids, street combat, genocide, separation from family and exile. The following section will present studies reporting PTSD prevalence rates among youth in various war-torn regions of the world.

### **Middle East.**

***Lebanon.*** The Lebanese Civil War took place between 1975 and 1990 and resulted approximately 250,000 military and civilian casualties. It is estimated that one million individuals exiled the country as a result of the violent conflict and that 75,000 people were still displaced within Lebanon as of 2012. Within this context, Saigh (1988) administered the DSM-III (APA, 1980) based CPTSDI (Saigh, 1987) to a sample of 92 Lebanese, 13-year-old adolescents enrolled in English-speaking private schools in Lebanon. Assessments were conducted during periods of bombings and terrorist attacks. While the interval between trauma exposure and assessment was not reported, 29.3% met criteria for PTSD. In a subsequent effort, Saigh (1989) administered the CPTSDI (Saigh, 1987) to 840 Lebanese youth (age range: 9-12) referred by physicians, Red Cross personnel, teachers and mental health practitioners due to emotional problems following exposure to war related stressors. Saigh reported that 27.5% of assessed youth met criteria for chronic PTSD.

Six years after the conclusion of the Lebanese Civil War, a 15-day military operation known as “Grapes of Wrath” resulted in over 1,100 air raids and extensive shelling. As a result, over 300,000 Lebanese civilians were displaced. Karam and colleagues (2000) examined PTSD

prevalence rates among 386 Lebanese youth exposed to stressors related to the military operation. Parent and child interviews were conducted using the Diagnostic Interview Schedule for Children and Adolescents –Revised (DICA-R; Reich et al., 1995). The prevalence of PTSD within this sample was 24.1%.

***Israel-Palestinian Conflict.*** A few studies examined the psychological impact of war related stressors among Palestinian children exposed to traumas related to the Israel-Palestine military conflict. For example, Khamis (2004) assessed the prevalence of PTSD within a sample of 1,000 Palestinian children between the ages of 12 and 16 years. Youth were recruited from United Nations Relief Work Agency schools in both East Jerusalem and the West Bank. Trauma exposure and PTSD were assessed using the Structured Clinical Interview for DSM-IV (SCID; First et al., 1996) PTSD module. The authors reported that 54.7% of children experienced at least one traumatic event in their lifetime. War related traumas were among the most commonly reported and included injury, death of a family member, imprisonment with physical abuse and destruction of home. Of the 547 children who reported trauma exposure, 341 (62.3%) met full diagnostic criteria for PTSD, constituting 34.1% of the total sample. In a similar investigation, Elbedour, Onwuegbuzie, Ghannam, Whitcome and Hein (2005) examined the prevalence of PTSD among 229 Palestinian adolescents between the ages of 15 and 19 (mean age: 17.13). The sample of adolescents was representative of youth living in the two refugee camps closest to where the majority of direct military confrontations occurred. Approximately one half of the interviewed adolescents reported witnessing a friend being killed, while 15.7% witnessed the death of a family member. Other reported traumas included their home being destroyed (7.9%), firing of missiles (7.9%) and being shot (4.4%). Assessments using the Post-Traumatic Stress

Disorder Interview (PTSD-I; Watson et al., 1991) indicated that 68.9% of the sample met DSM-IV (APA, 1994) diagnostic criteria for PTSD.

### **Southeast Asia.**

***Cambodia.*** The Indochinese conflict resulted in the 1975 occupation of Cambodia by the radical Marxist Pol Pot regime. In an attempt to return the country to an agrarian society, citizens were displaced from their homes and mandated to work in camps under extremely adverse physical and psychological conditions. Over the course of four years, thousands of people died of starvation due to unorganized efforts to produce and allocate food. Additionally, thousands of people were publicly executed or tortured under the governing regime. Within this context, Sack et al. (1994) investigated the prevalence of PTSD among a sample of 209 Cambodian refugees between the ages of 13 and 25 years (mean age = 19.8) living in the Portland and Salt Lake City area. At the time of the study, participants had resided in the United States for an average of 8.3 years. Based on individual assessments of the K-SADS-E (Puig-Antich, 1983), the authors reported a PTSD point prevalence rate of 18.2% and a lifetime PTSD prevalence rate of 21.5%. In a similar investigation, Hubbard et al. (1995) administered the Structured Clinical Interview for DSM-III-R - Non Patient Version (SCID-NP; Spitzer & Williams, 1986) to a sample of 59 Cambodian youth (age range: 16-25) residing in the United States. The authors reported a PTSD point prevalence rate of 24% and a lifetime prevalence of 59%.

Using the same methodology that was used in the Sack et al. (1994) study, Savin, Sack, Clarke, Meas and Richart (1995) assessed the prevalence of PTSD among a sample of 99 Cambodian youths (age range: 18-25) residing in Site II, a large refugee camp along the Thai-Cambodian border. While the refugee camp offered more security relative to life under the Pol Pot regime, rape, robbery, extortion, domestic violence and chronic malnutrition were common.



Individual administrations of the DISC (Welner et al., 1987) indicated a PTSD point prevalence rate of 31.3% and a lifetime PTSD prevalence rate of 37.3%. A PTSD diagnosis was significantly associated with a traumatic event related to the Pol Pot regime as opposed to a trauma endured in the refugee camp. Additionally, no significant differences in PTSD prevalence were reported between the Site-II refugees and refugees in the United States assessed by Sack et al. (1994).

### **Africa.**

***Rwanda and Sudan.*** Between April and July of 1994 an estimate of 800,000 Rwandese were killed as a result of genocide between two artificially delineated ethnic groups, the Hutu and Tutsi. Among the horrific events of the Rwandan Genocide are instances of husbands killing wives, teachers killing students and children killing fellow children. As a result of the genocide, a large percentage of children lost most family members and approximately 300,000 children lived in child-headed households. Within this context, Schaal & Helbert (2006) assessed the prevalence of PTSD among a sample of 68 Rwandan orphans between the ages of 13 and 23. At the time of the study, participants resided in either child-headed households or orphanages. Almost all participants (97%) reported having seen dead or mutilated bodies or were subject to an attack (88%). The majority of respondents witnessed someone being killed in a violent manner (77%) and almost half of the sample witnessed to the death of their own parents (44%). Based on individual interviews using the PTSD module of the CIDI (WHO, 1997), 44% of participants met criteria for PTSD.

Since 1980, approximately 3.2 million Sudanese have been displaced from their homes due to ongoing violence related to civil war, droughts and famine. In a study conducted prior to the Darfur War, Peltzer (1999) assessed the psychological sequelae of 56 Sudanese children

between the ages of six and 12 years residing in a northern Ugandan camp. All refugees experience separation from family members and lack of food or water. Based on individual administrations of the CPTSDI (Saigh, 1989) the authors reported that 20% of youth in this sample met DSM-III-R (APA, 1987) criteria for PTSD.

Taken together, the epidemiological research reviewed in this section indicated that PTSD prevalence rates among youth exposed to war-related stressors ranged from 18% to 68.9%. Table 1.2 presents the PTSD prevalence rates reported in the aforementioned war-related studies.

Table 1.2

*PTSD Prevalence Rates in Children and Adolescents Exposed to War-Related Traumas*

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
<b><i>Israel-Palestine Conflict</i></b>					
Elbedour Onwueghuzie, Ghannam, Whitcome & Hein (2007)	121 males 108 females	Mean Age: 17.13 years	CPTSDI	Not Reported	68.90%
Khamis et al. (2004)	523 males 477 females	Mean Age: 14.8 years	SCID	Not Reported	62.30%
<b><i>Lebanon</i></b>					
Karam et al. (2000)	386 children and adolescents	Not Reported	DICA-R	Not Reported	24.10%
Saigh (1998)	42 males 50 females	Age Range: 13 years	DSM-III Based CPTSDI	Not Reported	29.30%
Saigh (1989)	403 males 437 females	Age Range: 9-12 years	DSM-III Based CPTSDI	1-2 Years	32.50%
<b><i>Southeast Asia</i></b>					
Hubbard et al. (1995)	29 males 30 females	Mean Age: 19.5	SCID	15 years	Point: 24.00% Lifetime: 59.00%

Table 1.2 Continued

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
Sack et al. (1994)	104 males 105 females	Mean Age: 19.8	K-SADS	13 years	Point: 18.20% Lifetime: 21.50%
Savin, Sack, Clarke, Meas & Richart (1995)	89 males 10 females	Age Range: 18-25	K-SADS	10 years	Point: 31.30% Lifetime: 27.30%
<i>Africa</i>					
Peltzer (1999)	56 children	Age Range: 6-12	CPTSDI	Not Reported	20.00%
Schaal & Helbert (2006)	33 males 33 females	Mean Age: 15.23	CIDI	10 years	44.00%

## **Disaster/Accident Studies**

**Natural Disasters.** Natural disasters such as tornadoes, hurricanes and earthquakes are responsible for sudden mass-scale destruction of territories and loss of human life. The United Nations (2014) reported that since 1994 an estimate of 1.3 million individuals worldwide were killed as a result of a natural disaster while 4.4 billion were adversely impacted. In addition to the potential for injury and loss or separation from caregivers, child and adolescent survivors of natural disasters face several stressors including lack of food, water, shelter and access to medication.

In 1988, an earthquake with a magnitude of 6.9 on the Richter scale was registered in Armenia. The earthquake led to the death of approximately 25,000 people and forced thousands more to relocate in distant locations. Within this context, Najarian et al. (1996) evaluated the prevalence of PTSD among 73 survivors between the ages of 11 and 13 years. Of these, 25 lived in tents and shelters near the epicenter of the earthquake. This group of children were witness to horrifying scenes of mutilated and burnt bodies that lasted for days. A second group consisted of 28 children and their families who were immediately relocated to hotels and sanitariums in Yerevan, a region of Armenia that only suffered mild damage from the earthquake. Lastly, a comparison group of 25 children that lived in Yerevan during and after the earthquake were also interviewed. All children were assessed 2.5 years from the day of the earthquake using the DSM IV based DICA PTSD module (Kaplan & Reich, 1991). Results indicated that the prevalence of PTSD among children living in the earthquake city (32%) was significantly greater than the prevalence of PTSD in relocated children (28%) and the comparison group (4%).

In May of 2008, an 8.0 magnitude earthquake killed more than 70,000 people in mid-western China leaving thousands of children orphaned. Within this context, Ma et al. (2010) assessed the prevalence of PTSD among a sample of 3,208 children between the ages of 12 and 18 recruited from schools in several counties surrounding the earthquake's epicenter. Six months after the earthquake children were screened for trauma exposure and PTSD symptoms using the DSM-IV based Children's Revised Impact of Event Scale (CRIES; Smith, 2003) and the Post-Traumatic Cognition Inventory (PTCI; Foa et al., 1999). Of the 3,208 youth that were screened, 332 produced ratings indicating elevated PTSD symptomology. Consequently, these children were formally assessed for a PTSD diagnosis using the K-SADS –Present and Life Version (K-SADS-PL; Kaufman, Birmaher, Brent, Ryan & Rao, 2000). Of the 332 interviewed children, 79 met full criteria for PTSD, constituting 2.5% of the total sample.

As part of a large study examining executive functioning skills in youth with PTSD, Yang et al. (2014) examined the prevalence of PTSD among 523 adopted children relocated to the Shandong province of China following the 2008 earthquake. Each child was assessed for a PTSD diagnosis four and 12 months after the earthquake using the Chinese version of the K-SADS-PL (Kaufman et al., 2000). Exclusion criteria for the study included a history of head trauma; a full scale IQ score less than 80 based on the Chinese version of the Wechsler Intelligence Scales for Children (Gong & Chai; 1993); substance abuse and a comorbid psychiatric illness. All children in the sample were between the ages of nine and 17 years and were fluent in Chinese. The authors reported that at the four-month assessment, 34 of the 532 subjects (6%) met diagnostic criteria for PTSD. Only 4 of the 32 youth with PTSD continued to meet diagnostic criteria at the 12 month follow up.

Regarding epidemiological studies following flood disasters, Earls, Smith, Reich and Jung (1988) investigated the posttraumatic reactions of youth following large-scale flooding in townships surrounding St. Louis, Missouri. Of the 20 families that participated in the study, all were forced to evacuate their homes and many suffered extensive property loss. A sample of 39 children between the ages of six and 17 years were assessed for PTSD and other disorders using the DSM-III version of the DICA (Herjanic & Reich, 1982). Notably, none of the children met full diagnostic criteria for PTSD in this sample.

Hurricane Katrina brought unprecedented levels of destruction to the city of New Orleans. An estimate of 1,500 people died as a result of damage caused by the hurricane and almost all of New Orleans's citizens were forced to evacuate. Within this context, Scheeringa and Zeanah (2008) examined the prevalence of PTSD among a sample of 70 preschool children (age range: 3-6) and their caregivers in the aftermath of Hurricane Katrina. Of the interviewed children and caregivers, 65.8% evacuated before the hurricane hit the city, while the rest were trapped in the flooded city. A total of 32 (45.7%) children were separated from their caregivers at a point during the emergency. Administrations of the DIS (Robins et al., 1981) with caregivers indicated that 15.7% of preschoolers met DSM-IV-TR (APA, 2000) PTSD criteria.

Jones, Ribbe and Cunningham (1994) examined the psychological sequelae of 23 children (age range: 7-18) whose homes were destroyed as a result of a large-scale wildfire in California. Based on the administration of the DSM-IV based DICA-R (Reich and Welner, 1990) the authors reported that two of the 23 (8%) victims met criteria for PTSD. In a related study, Jones and Ribbe (1991) administered the DICA-R (Reich and Welner, 1990) to 38 boys (age range: 14-19) from a private secondary boarding school. Of the 38 participants, 25 survived a fire that destroyed part of the boy's dormitory while the remaining 16 participants were students at the

boarding school not involved in the fire. The authors reported a PTSD prevalence rate of 12% among boys directly-exposed to the fire and a rate of 0% among students not involved in the fire.

**Motor Vehicle and Transportation Accidents.** As reported earlier in this chapter, thousands of children are involved in car accidents every year, many of whom suffer severe injuries and the death of a parent. Stellard, Velleman and Baldwin (1998) assessed 119 British children between the ages of five and 18 who survived a traffic accident. Participants were assessed for PTSD an average of 40 days after their accidents using the DSM-IV based CAPS-C (Nader et al., 1996). A PTSD prevalence rate of 34% was reported among the sample of children involved in automobile accidents.

In a more recent study, Keppel-Benson, Ollendick and Benson (2002) administered the DICA-R-C (Reich & Welner, 1990) to 50 children (age range: 7-16) in the U.S. approximately nine months after they sustained an injury caused by a motor vehicle accident. Most children were passengers in an automobile (70%), while the remaining children were struck by a car while they were either pedestrians (20%) or riding a bicycle (10%). Of the 50 interviewed children, seven (14%) met full DSM-III-R (APA, 1987) PTSD criteria. Of these, three were passengers in a car, three were on their bicycles and one was a pedestrian struck by a car. Finally, Zink and McCain (2003) administered the DICA-R (Reich & Welner, 1990) to 143 children between the ages of 4 and 18 years who also suffered an automotive-related incident. PTSD was assessed at two and six months post-injury along with routine hospital check-ups. The authors reported that two months after their accident, 18% of children met criteria for PTSD. At the six-month follow up, 30% of these children continued to meet criteria. The overall PTSD prevalence rate for this sample was 22%.



With regard to transportation accidents, Yule et al. (2000) assessed the prevalence of PTSD among a group of individuals who survived a nautical incident as adolescents. In 1988, the cruise ship “Jupiter” collided with another ship off the coast of Greece and sunk within 45 minutes. An estimate of 400 school aged British children between the ages of 11 and 18 years were rescued. Of those children, 217 agreed to take part in the study five to eight years following the disaster. The prevalence of PTSD among survivors was compared to a community control group of 87 aged-matched individuals. Administrations of the DSM-IV based Clinician Administered PTSD Scale (CAPS; Blake et al., 1990) indicated that 51.7% of the survivors met full PTSD criteria some time following the disaster. The vast majority of survivors (90%) who developed PTSD did so within six months of the incident. Notably, the prevalence of PTSD among survivors was significantly higher compared to the control group (3.4%).

Overall, the literature reviewed in this section indicated that PTSD prevalence rates among child and adolescent survivors of natural disasters and accidents ranged between 0% to 51.70%. Table 1.3 presents the PTSD epidemiological estimates as indicated by the natural disaster and accident investigations that were considered.

Table 1.3

*PTSD Prevalence Rates in Child and Adolescent Victims of Natural Disasters or Accidents*

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
<b><i>Natural Disasters</i></b>					
Earls et al. (1998)	16 males 16 females	Age Range: 6-17 years	DICA	1 year	0.00%
Jones & Ribbe (1991)	38 males	Age Range: 14-19 years	DICA	Not reported	Directly Exposed: 12% Indirectly Exposed: 0%
Jones, Ribbe & Cunningham (1994)	7 males 14 females	Age Range: 7-18 years  Mean Age: 11.4 years	DICA-R	Not reported	8.00%
Ma et al. (2000)	1536 males 1,671 females	Age Range: 12-18 years	K-SADS	6 months	2.5%
Najarian et al. (1996)	37 males 37 females	Age Range: 11-13 years	DICA-R	2.5 years	Earthquake City: 33.00% Relocated: 28.00% Low Exposure: 4.00%
Scheeringa & Zeanah (2008)	40 males 30 females	Age Range: 3-6 years Mean Age: 5.1	DIS	Not reported	15.70%

years

Table 1.3 Continued

Study	Participants	Age	Measure(s)	Elapsed Time	PTSD Prevalence
Yang et al. (2014)	523 children and adolescents	Age Range: 9-17 years	K-SADS-PL	4 & 12 months	4 months: 6.00% 12 months: < 1.0%
<i>Motor Vehicle and Transportation Accidents</i>					
Keppel-Benson, Ollendick & Benson (2002)	29 male 21 females	Age Range: 7-16 years Mean Age: 11.6 years	DICA-R	Not Reported	14.00%
Stellard, Velleman & Baldwin (1998)	68 males 51 females	Age Range: 5-18 years	CAPS-C	Not Reported	34.50%
Yule et al. (2000)	217 survivors	Not Reported	CAPS	5-8 years	51.70%
Zinc & McCain (2003)	85 males 58 females	Age Range: 14-18 years	DICA-R	2 & 6 months	22%

## **Comorbidity**

A number of studies have indicated that PTSD is frequently associated with concurrent psychiatric disorders (Kulka et al., 1990). Epidemiological research conducted with adults suggests that an overwhelming percentage of adults with PTSD also suffer from another psychiatric condition (Brady, Killeen, Brewerton, & Luccirini, 2000). For example, results from the National Comorbidity Survey (Kessler, 1995) indicated that 88.3% of men and 79% of women diagnosed with PTSD suffered from at least one other psychiatric disorder. Specifically, Major Depressive Disorder (MDD) was frequently observed in both adult men (47.9%) and women (48.5%) with a lifetime history of PTSD. Additionally, alcohol abuse was more frequently observed in men (51.9%) with a history of PTSD compared to women (27.9%). Notably, Kessler (1995) reported that a PTSD diagnosis very frequently proceeded comorbid mood disorders and substance use.

With regard to the literature pertaining to the prevalence rates of comorbid disorders among youth with PTSD, only a few of the 47 reviewed community and population studies provide prevalence rates for co-existing psychiatric disorders. For example, in a community study of older adolescents in the United States, Giaconia et al. (2005) reported that 41.7% adolescents diagnosed with PTSD also met criteria for MDD, as assessed through the DSM-III-R (APA, 1987) based DIS-III-R (Robins et al., 1989). Additionally, a diagnosis of PTSD was associated with the onset of substance abuse and alcohol dependence for more than half of the adolescents diagnosed with PTSD. In another community sample, Perkonig et al. (2000) reported a high instance of comorbidity among a large sample of German youth diagnosed with PTSD. Using the DSM-IV (APA, 1994) based Munich CIDI (Witthen et al., 1998) the authors reported that 87.5% of youth diagnosed with PTSD also met criteria for at least one additional

psychiatric diagnosis, while 77.5% met criteria for two or more additional diagnoses including a wide range of anxiety, mood, somatoform and substance abuse disorders. The prevalence rates of comorbid disorders among youth with PTSD in this sample were reported on the basis of whether the onset occurred prior to PTSD, within the same year as PTSD or following PTSD. Overall, anxiety disorders commonly preceded the onset of PTSD and were diagnosed in 54.2% of youth who went on to develop PTSD. Notably, 85.7% of individuals with PTSD were diagnosed with simple phobia, while 75% met criteria for social phobia prior to a diagnosis of PTSD. Somatoform disorders (66.7%) and eating disorders (80%) were also frequently observed prior to the onset of PTSD. With regard to disorders occurring within the same year as PTSD, panic disorders with and without agoraphobia were reported by 80% and 75% of the sample of youth with PTSD, respectively. Mood disorders and substance abuse disorders were also highly related to PTSD and were more likely to develop following the onset of PTSD. Comorbidity rates for mood disorders secondary to PTSD were reported at 40% for Bipolar Disorder, 56.5% for MDD and 50% for Dysthymic disorder. Substance abuse and dependence disorders were also more likely to be diagnosed after the onset of PTSD. Specifically, 55.5% of youth with PTSD also met criteria for alcohol abuse, 75% met criteria for drug abuse and 72.7% met criteria for nicotine dependence.

The co-occurrence of PTSD with mood and anxiety disorders was further examined by Ackerman et al. (1988) among a sample of physically and sexually abused children between the ages of seven and 13 years. Of the 63 children diagnosed with PTSD, 90% also met criteria for an additional DSM-III psychiatric disorder, as diagnosed through administration of the DICA (Reich & Welner, 1988). While the authors did not report prevalence rates of comorbid disorders, significant statistical associations were noted between PTSD and MDD, Dysthymia

and Separation Anxiety. Analogously, Linning and Kearney (2004) assessed comorbidity among a sample of maltreated youth using the DSM-IV (APA, 1994) based Anxiety Disorder Interview Schedule (Silverman & Albano, 1996). Results indicated that maltreated youth with PTSD were more likely to be diagnosed with MDD (35.10%) compared to maltreated youth without PTSD (0%). Moreover, PTSD was statistically associated with a diagnosis of Generalized Anxiety Disorder (48.6%) and panic disorder with (80%) or without agoraphobia (75%).

Several investigations of the psychological sequelae of Cambodian refugees following their escape from the Pol Pot regime provide valuable information regarding comorbid disorders among youth with PTSD. Within this context, Sack et al. (1993) observed that 60% of the participants who met criteria for PTSD also met DSM-III criteria for MDD based on administrations of the DICA (Reich & Welner, 1988). In a related effort, Sack et al. (1994) assessed comorbidity among a larger sample of Cambodian youth with PTSD living in Oregon and Utah. Using the K-SADS-E (Puig-Antich, 1983), the authors reported that youth with PTSD were approximately 3.5 and 4.3 times more likely to meet DSM-III-R (APA, 1987) criteria for a depressive or anxiety disorder than youth without PTSD.

Using a separate sample of Cambodian refugees residing in the United States, Hubbard et al. (1995) reported that 57% of refugees diagnosed with PTSD also met criteria for another Axis I diagnosis. Among the participants diagnosed with PTSD at the time of the study, the prevalence rates of comorbid MDD and GAD was 21% for both disorders. Additionally, 29% of participants also met concurrent criteria for somatoform pain disorder, although this was only observed in females. Notably, none of the participants with PTSD met criteria for substance abuse disorder.

Some studies have also considered the co-occurrence of neurodevelopmental and disruptive disorders among youth with PTSD. For example, McLeer et al. (1993) used the K-SADS-E (Puig-Antich, 1983) to assess the prevalence of comorbid disorders within a sample of sexually abused youth between the ages of six and 16 years. Of these, 23.1% of youth diagnosed with PTSD also met DSM-III criteria for Attention Deficit Hyperactivity Disorder (ADHD). Additionally, 15.1% of the sample had co-occurring diagnoses of PTSD and Conduct Disorder (CD) and 11.5% were diagnosed with all three disorders. With regard to preschool-age children, Scheeringa & Zeanah (2008) assessed the prevalence of comorbidity among young survivors of Hurricane Sandy using the DIS (Robins et al., 1981). Results indicated that of the 35 children who developed PTSD, 20 (60.6%) also met diagnostic criteria for ODD, while overlap between PTSD and ADHD was observed in 33.3% of children with PTSD. Regarding co-occurring mood and anxiety disorders, 42.9% of children with PTSD also met criteria for MDD while 21.2% met criteria for Separation Anxiety Disorder (SAD). Overall, the authors reported that PTSD was comorbid with at least one of the four disorders 88.6% of the time.

Table 2 reports rates of comorbidity reported in the studies reviewed.

Table 2

*Prevalence of Comorbid Diagnoses with PTSD*

<b>Study</b>	<b>Measure(s)</b>	<b>Prevalence of Comorbidity</b>
Giaconia et al. (2005)	DIS-III-R	Major Depressive Disorder: 41.70% Simple Phobia: 29.20% Social Phobia: 33.30% Alcohol Dependence: 45.80%
Hubbard et al. (1995)	SCID-NP	Major Depressive Disorder: 21.00% Generalized Anxiety Disorder: 21.00% Social Anxiety Disorder: 21.00% Somatoform Disorders: 29.00%
Linning & Kearney (2004)	ADIS-C	Major Depressive Disorder: 35.10% Panic Disorder: 18.40% Separation Anxiety Disorder: 35.10% ADHD: 35.10%
McLeer et al. (1994)	K-SADS-E	Panic Disorder: 18.40% ADHD: 15.10% ADHD & Conduct Disorder: 11.50%
Perkonig et al. (2000)	Munich CIDI	Depressive Disorders: 68.50% Simple Phobia: 87.5% Social Phobia: 75.00% Panic Disorder With Agoraphobia: 80% Without Agoraphobia: 75% Somatoform Disorder: 66.7% Eating Disorders: 80% Substance Use/Dependence: 70.60%
Sack et al. (1993)	K-SADS-E DSM-III DICA	Major Depressive Disorder: 60.00%
Sheeringa & Zeanah (2008)	DIS	Oppositional Defiant Disorder: 60.60% ADHD: 33.30% Major Depressive Disorder: 42.90% Separation Anxiety Disorder: 22%



## **Risk Factors for PTSD**

Several studies presented in this review provide information regarding risk factors related to PTSD. The next section will review information of risk factors including: age, gender, race/ethnicity, type and mode of trauma, the intensity and frequency of exposure to traumatic events, time elapsed since trauma exposure, child characteristics and parent psychopathology.

### **Gender**

The majority of studies in this review indicated that females were more likely to develop PTSD compared to males (Breslau et al., 2004; Breslau et al.; 2006; Cuffe; 1998; D'Augelli, 2006; Giaconia et al., 1995; Hubbard et al., 1995; Kessler et al., 1995; Linning & Kearney; 2004; Ma et al., 2011; Merikangas et al., 2010; Merry & Andrews, 1996; Perkonig et al. 2006 Rheingold et al. 2012; Schaal & Helbert, 2006; Stellard, Veleman, Baldwin). For example, Giaconia et al. (1994) reported that older adolescent females were four times more likely to develop PTSD compared to males. Similarly, Cuffe et al. (1998) reported odds ratios suggesting that adolescent females were 14 times more likely to develop PTSD compared to males. Among Cambodian refugees, Hubbard et al. (1995) reported that females were more likely to meet criteria for lifetime PTSD compared to males. In their sample of Rwandan genocide survivors, Schaal and Helbert (2006) noted that more females (60%) compared to males (27%) developed PTSD. Comparable results were also reported by Perkonigg et al. (2006) among a sample of German youth. Lastly, in a study pertaining to PTSD prevalence among gay, lesbian and bisexual youth, D'Augelli et al. (2006) reported that PTSD was diagnosed three times more among females compared to males.

Contrary to studies suggesting that female youth are more likely to develop PTSD, Khamis (2005) reported that among a sample of Palestinian youth, 58.7% of males met criteria

for PTSD compared to 41.3% of females. Interestingly, the author noted that while boys experienced more traumatic events relative to girls, there was ultimately no statistically significant gender effect after controlling for other factors. In that vein, several studies indicated no gender differences in rates of child and adolescent PTSD (Ackerman et al., 1998; Broman-Fulks et al., 2007; Luthra et al., 2009; Sack et al., 1994; Saigh 1988; Saigh 1989a; Scheeringa & Zeanah; 2008; Silva et al., 2000; Vila et al., 1999).

Some studies have suggested that the higher prevalence of PTSD among female youth could be attributed to the increased likelihood of females to experience more severe traumas such as rape. Nevertheless, results pertaining to the interaction between gender and trauma severity relative to PTSD status have been inconsistent. For example, Breslau et al. (2004) observed that the frequency of reported acts of assaultive violence were significantly higher among inner-city adolescent females (62.6%) compared to males (33.7%). Additionally, females were significantly more likely to develop PTSD compared to males in the aftermath of assaultive violence but not following other types of trauma. Conversely, Giaconia et al. (1995) reported that adolescent females were significantly more likely to develop PTSD even when no differences in type or severity of traumas existed between males and female trauma-exposed youth. Similarly, Perkonig et al. (2006) reported that although boys reported a higher number of traumatic events, females were more likely to develop PTSD for all reported traumas.

### **Age**

A number of studies in this review provided information pertaining to age as a possible risk factor for PTSD. For example, Merikangas et al. (2010) reported that within a sample of 10,123 adolescents assessed as part of the NCS-A, older adolescents were more likely to develop PTSD relative to younger adolescents. In another large national epidemiological survey,

Kilpatrick and Saunders (1997) reported lower PTSD prevalence rates among 12 and 13 year old adolescents (3.6% and 4.9%) compared to 16 and 17 year old adolescents (13.7% and 11.9%). Additionally, the authors reported that age was positively associated with PTSD even when controlling for other demographic variables. Specifically, 16 and 17 year old children were 3.44 times more likely to develop PTSD compared to 12 and 13-year-old children. Similarly, Khamis (2005) reported that PTSD prevalence rates among Palestinian children were significantly higher among older children in the sample. Sack et al. (1994) noted that within the cohort of Cambodian adolescent refugees, older youth were significantly more likely to develop PTSD. Notably, the association between age and mental illness in this sample was only observed relative to PTSD and not depressive or anxiety disorders. The authors posited that older youth may possess recollections of separation from caregivers during the Pol Pot regime; meanwhile, younger children in the sample were not separated from their parents while in Cambodia or had no recollection of the traumatic events they experienced. Lastly, Perkonig et al. (2006) reported that among their sample of German youth, a diagnosis of PTSD was very uncommon in children younger than 11. Interestingly, the authors reported that participants who experienced a qualifying traumatic event prior to the age of 12 were at significantly higher risk for developing PTSD although the age of PTSD onset for these participants was not reported.

Notably, none of the studies reviewed indicated a higher risk of PTSD among younger children. Outside of the reviewed literature, some studies have reported higher rates of PTSD among younger children (Yelland et al., 2010; Schwarzwald et al., 1993); however these investigations did not employ well-established clinical interviews to establish a diagnosis of PTSD.

It is important to consider that some studies reported no age differences relative to the prevalence of PTSD among participants, even when utilizing a wide age range in their samples (Schaal & Elbert, 2006; Yang et al., 2011; Zink & McCain, 2003). Additionally, the finding that older children are at increased risk for developing PTSD compared to younger children should be interpreted with the understanding that the diagnostic criteria for PTSD may not have been sensitive to the expression of PTSD in younger children (Scheeringa & Zeanah, 2008).

### **Race/Ethnicity**

The relationship between race and/or ethnicity and PTSD should be examined with caution and with the understanding that the definition of terms such as race, culture and ethnicity may vary substantially across studies (Rojas & Pappagallo, 1999). Additionally, many of the studies reviewed in this chapter utilize sample sizes that may be too small to meaningfully identify cultural and ethnic membership as a potential risk factor for PTSD.

With regard to large-scale surveys of nationally representative samples, Kilpatrick and Saunders (1997) reported that rates of both lifetime and current PTSD were significantly higher among non-Caucasian adolescents (current: 6.7%; lifetime: 9.9%) compared to Caucasian adolescents (current: 4.1%; lifetime: 7.3%); however, these differences became non-significant after controlling for family alcohol and drug problems, number of sexual and physical assault and number of violent incidents witnesses. Using the same sample, Kilpatrick et al. (2003) observed that among adolescents presenting with PTSD in the absence of comorbid disorders, Hispanic adolescents were 4.1 times more likely to develop PTSD compared to White, non-Hispanic adolescents. Meanwhile, African American adolescents were 2.5 times more likely to develop PTSD compared to White, non-Hispanic adolescents. Notably, African American subjects with PTSD were less likely to develop a comorbid disorder compared to White, non-

Hispanic adolescents. Despite these findings, the authors reported that relative to race and/or ethnicity, other demographic variables such as age and gender were more robustly linked to a diagnosis of PTSD.

It is also noteworthy that several studies in this review observed non-significant differences in PTSD prevalence in terms of race/ethnicity (Abram et al., 2004; Breslau et al., 2004; Breslau et al., 2009; Cuffe et al., 1998; Linning & Kearney, 2004; Silva et al., 2000; Zink & McCain; 2000). Hence, the relationship between race/ethnicity and PTSD among youth remains unclear.

### **Type and Mode of Trauma**

The existing epidemiological literature on child and adolescent PTSD suggests that the means by which youth are exposed to a traumatic event may be a risk factor for PTSD. For example, Saigh (1991) reported that among 230 trauma-exposed Lebanese youth, 25.2% met PTSD criteria after direct exposure to a trauma (e.g., physical injury), 55.6% met criteria after being witness to a trauma, and 5.6% developed PTSD after learning about the death or near death of a family member. With regard to epidemiological research conducted on community samples, Kilpatrick et al. (2013) reported that individuals exposed to interpersonal violence such as physical/sexual assault or witnessing violence were significantly more likely to develop PTSD. Similarly, Luthra et al. (1999) observed that a diagnosis of PTSD was significantly associated with experiencing physical or sexual abuse, hearing traumatic news, and witnessing domestic violence. Among adolescents, Giaconia et al. (1995) observed that for females, being raped or sexually assaulted constituted the greatest risk of developing PTSD. Analogously, Cuffe et al. (1998) reported that rape, sexual abuse and witnessing a serious accident were significantly associated with a diagnosis of PTSD relative to other traumatic events. Finally, Braslau et al.

(2004) reported that the prevalence of PTSD was the highest among youth who experienced assaultive violence (15%) compared to those who learned about an unexpected death (9%), those who sustained injuries unrelated to assault (6.6%), and those who learned about a traumatic event occurring to a relative (2%).

### **Intensity and Frequency of Exposure to Traumatic Event**

Research has provided conflicting evidence regarding the relationship between PTSD and the intensity or frequency of stress exposure. A few studies examined differences in the prevalence of PTSD between groups of youth with varying levels of exposure to the same traumatic circumstance. For example, in their epidemiological survey following the 1988 Armenian earthquake, Najarian et al. (1995) observed that youth who remained in the earthquake city had a higher prevalence of PTSD compared to youth who lived in a less impacted area. Similarly, Vila et al. (2000) reported that children held hostage in a classroom demonstrated higher rates of PTSD compared to a group of children within the same school who were not held hostage. Conversely, Scheeringa and Zeanah (2008) did not observe a significant difference in the prevalence of PTSD between youth who remained in New Orleans during hurricane Katrina and youth who evacuated the city before the storm. In the same vein, Saigh, Yasik, Mitchell and Albright (2002) assessed the prevalence of PTSD among a sample of New York City preschool children who were either directly or indirectly exposed to the terrorist attacks of September 11<sup>th</sup>. Probable PTSD was assessed through parent ratings on a questionnaire that closely corresponded to DSM-IV PTSD criteria (Saigh et al., 2001). The authors reported a probable PTSD point prevalence rate of 0% for the sample. While number of traumatic events was positively correlated with number of PTSD symptoms, there were no differences between the directly and indirectly exposed children with regard to probable PTSD status.

Other studies have suggested a positive relationship between PTSD and the number of traumas experienced. Using data from the NSA, Ford et al. (2010) reported that youth exposed to multiple traumatic events were three times more likely to develop PTSD compared to youth who only experienced one type of trauma. In a similar vein, Schaal and Elbert (2006) observed that Rwandan youth who experienced more war-related traumas had a higher incidence of PTSD. Notably, the authors reported that relatively more intense traumatic events, such as witnessing the death of a parent, were significantly associated with PTSD. With regard to sexually abused youth, Ackerman and colleagues (1998) observed that youth who reported both sexual and physical abuse demonstrated a higher risk for PTSD compared to youth who were only sexually or physically abused. In a similar investigation, Silva et al. (2000) reported a higher prevalence of PTSD among youth who witnessed domestic violence and were also physically abused.

### **Time Interval Between Trauma Exposure and Diagnostic Evaluation**

The literature reviewed varied significantly in the amount of time elapsed between exposure to trauma and evaluation. This inconsistency likely contributes to the variability in PTSD prevalence rates given the evidence from the adult literature suggesting that PTSD symptoms typically remit to sub-diagnostic status over time (APA, 2013). Several studies in this review are consistent with these findings. For example, Vila et al. (1999) reported that the prevalence of PTSD among children taken hostage decreased from 11.5% at one month to 3.8% after 18 months. Similarly, Sack et al. (1994) observed a consistent decline in PTSD prevalence among a cohort of Cambodian refugees. Specifically, the instance of PTSD declined from 50% at five years since obtaining refugee status to 38% at the 11-year follow up. Further, Yang et al. (2000) studied Chinese earthquake survivors and observed a decrease in PTSD status over time. Specifically, the authors reported a PTSD prevalence rate of 6% four months following the

trauma; however, less than 1% of the sample continued to meet criteria for PTSD at the 12 month follow up. Finally, Zinc and McCain (2003) reported that motor vehicle accident survivors demonstrated a 66% decrease in PTSD prevalence between the initial assessment two months after the incident and the six-month follow up. Collectively, these studies support the observation that symptoms of PTSD tend to ameliorate over time and that rates of diagnoses are likely to be higher when assessed in temporal proximity to the occurrence of the traumatic stressor.

### **Child Characteristics**

According to the DSM-5 (APA, 2013), pre-traumatic factors such as mental illness and intelligence may be associated with the development of PTSD. For example, Perkonig and colleagues (2000) reported that females who met criteria for social phobia prior to being raped were at an increased risk for developing PTSD. Additionally, the authors reported that a primary diagnosis of a depressive disorder increased the likelihood of PTSD status regardless of sex or the type of traumatic stressor experienced. Similarly, Vila et al. (1999) observed that among children who were taken hostage in a classroom, those who developed PTSD had higher rates of preexisting disorders. In the same vein, Silva et al. (2000) observed that antecedent anxiety was related to a higher likelihood of developing PTSD. Furthermore, the authors reported that IQ was inversely related to a diagnosis of PTSD within this sample.

These relationships should be interpreted with caution, as preexisting disorders were assessed retrospectively due to the cross-sectional design of the aforementioned studies. Only one of the studies reviewed utilized a prospective design to investigate the relationship between a range of child characteristics and PTSD. In the Breslau et al. (2006) study, 823 youth were initially assessed at age six for behavior problems, intelligence and anxiety disorders. The same



cohort was reassessed at age 17 to examine the prevalence of trauma exposure and PTSD. Among the trauma-exposed participants, any DSM-III-R (APA, 1987) anxiety disorder diagnosed at age six increased the likelihood of developing PTSD. Additionally, teacher's ratings of externalizing problems at age six were also positively related to a diagnosis of PTSD. With regard to intelligence, trauma-exposed children whose IQ scores were above 115 on the Wechsler Intelligence Scales for Children, Revised (WISC; 1972) were significantly less likely to develop PTSD compared to children with lower scores. In a separate investigation, Saigh et al. (2006) compared the Wechsler Intelligence Scale for Children, Third Edition (WISC-III; Wechsler, 1991) scores of trauma-exposed youth with and without PTSD, and a non-traumatized group. After controlling for comorbid disorders, prior history of trauma, and English proficiency, trauma-exposed youth with PTSD scored significantly lower on verbal subtests relative to trauma-exposed youth without PTSD and controls. No significant differences were observed between the trauma-exposed group without PTSD and controls. While these results support the observation that lower intelligence may be a risk factor for PTSD, it is important to consider that emotional symptoms present at the time of assessment may have impacted performance on cognitive measures.

### **Parental Psychopathology**

Some research suggests that parental psychopathology may be related to an increased risk of PTSD among children and adolescents. For example, both Kilpatrick and Saunders (1997) and Linning and Kearney (2004) reported that youth with PTSD were significantly more likely to come from families with a history of alcohol and substance abuse. In a similar vein, Sack et al. (2013) reported higher PTSD prevalence rates among children whose parents also had PTSD. Notably, 41% of children with PTSD had two parents who met criteria for PTSD. In a related

study, Famularo et al. (1994) indicated that among a sample of maltreated youth, those who met criteria for PTSD were significantly more likely to have a mother who also met diagnostic criteria. With regard to disaster survivors, Scheeringa and Zeanah (2008) reported a positive association between the number of caregiver PTSD symptoms and those of their children following Hurricane Katrina. Similarly, Khamis (2005) observed that Palestinian refugees who reported high levels of anxiety within their families also endorsed more symptoms of PTSD.

### **Chapter Summary**

The epidemiological research reviewed clearly indicates that children and adolescents are commonly exposed to traumatic stressors including war, natural disasters, criminal victimization and accidents. Despite the high frequency of trauma exposure reported in these studies, only a minority of youth developed PTSD. Overall, the prevalence of PTSD reported in the reviewed literature ranged from 0% to 89.3%. Specifically, PTSD prevalence rates in youth ranged from 2% to 89.3% following criminal victimization, 18% to 68.9% following war related traumas and 0% to 51.7% following disasters or accidents.

The significant variance in prevalence rates may be due to a host of factors including the various instruments used, the demographic characteristics of the samples, the type and intensity of the stressors and the time between trauma exposure and assessment. An additional contribution to the differing rates of diagnosis may be related to the inconsistency in diagnostic criteria utilized across the body of reviewed literature. Specifically, this review included studies that assessed PTSD based on DSM-III (APA, 1980), DSM-III-R (APA, 1987), DSM-IV (APA, 1994), DSM-IV-TR (APA, 2000) and DSM-5 (APA, 2013) criteria.

Prevalence rates for many of the study reviewed in this chapter were derived using well-established structured or semi-structured interviews that closely match DSM criteria. While these

instruments represent the gold-standard for diagnostic assessment (Cohen, 1998), it is important to consider that the variations in the reliability and validity of these instrument may have contributed to the variability in PTSD prevalence rates. Additionally, the variance in PTSD rates may be due to the time elapsed between trauma exposure and assessment of PTSD. Given the research suggesting that diagnostic rates of PTSD decrease over time (Vila et al., 1999), PTSD reported rates may vary based on the timing of the assessment relative to the traumatic event.

The reviewed literature suggests that children and adolescents with PTSD often meet criteria for comorbid diagnoses including a range of anxiety, mood, and externalizing disorders. This finding is significant, as the co-occurrence of other psychiatric disorders with PTSD challenges the interpretation and comparison of scientific results and can significantly interfere with the treatment of PTSD.

The aforementioned epidemiological research provided mixed results in terms of the relationship between PTSD prevalence and personal factors such as age, gender, race/ethnicity, intelligence, pre-existing disorders and parent psychopathology. With regard to gender, 14 studies reported that females were more likely to develop PTSD relative to males (Breslau et al., 2004; Breslau et al., 2006; Cuffe, 1998; D'Augelli, 2006; Giaconia et al., 1995; Hubbard et al., 1995; Kessler et al., 1995; Linning & Kearney, 2004; Ma et al., 2011; Merikangas et al., 2010; Merry & Andrews, 1996; Perkonigg et al. 2006 Rheingold et al. 2012; Stellard, Veleman, Baldwin). Conversely, nine studies did not report gender differences in rates of PTSD (Ackerman et al., 1998; Broman-Fulks et al., 2007; Luthra et al., 2009; Sack et al., 1994; Saigh 1988; Saigh 1989a; Scherringa & Zeenah, 2008; Silva et al., 2000; Vila et al., 1999). In terms of age, five studies reported a higher prevalence of PTSD among older youth (Khamis, 2005; Kilpatrick & Saunders, 1997; Merikangas et al., 2010; Perkonigg et al., 2006; Sack et al., 1994),

while three studies did not report significant age differences (Schaal & Elbert, 2006; Yang et al., 2011; Zink & McCain, 2003). Results reporting race/ethnicity differences in PTSD prevalence were inconclusive and should be interpreted with caution due to small sample sizes and variable terminology. With regard to child characteristics, three studies indicated that intelligence is inversely related to the risk of developing PTSD (Breslau et al., 2006, Saigh et al., 2000; Silva et al., 2000), while four studies indicated that children with preexisting mood, anxiety and externalizing disorders were at increased risk to develop PTSD (Breslau et al., 2006; Perkonig et al., 2000; Silva et al., 2000; Vila et al., 1999). Finally, two studies reported a higher prevalence of PTSD among children from families with a history of substance and alcohol use (Kilpatrick & Saunders; 1997; Linning & Kearney; 2004) and two studies indicated a higher prevalence of PTSD among children whose parents also met criteria for the disorder (Famularo et al., 1994; Sack et al., 1993).

In addition to personal factors, several studies indicated a positive association between the frequency of trauma exposure and rates of PTSD diagnosis (Ackerman et al., 1998; Ford et al., 2010; Schaal & Elbert, 2006; Silva et al., 2000). Finally, four studies suggested that exposure to interpersonal violence (e.g., physical/sexual assault; witnessing a serious accident) was associated with a higher prevalence of PTSD relative to traumas not interpersonal in nature (e.g., car accidents, fires; Breslau et al., 2004; Cuffe et al., 1998; Giaconia et al., 1995; Kilpatrick et al., 2013; Luthra et al., 1999).

Overall, the literature suggests that children and adolescents are exposed to a wide range of traumatic experiences. While epidemiological research provides abundant evidence suggesting that only a minority of trauma-exposed youth develop PTSD, methodological issues in research make accurate predictions of PTSD prevalence rates difficult. Hence, further prospective

research is required to analyze the relationship between trauma exposure and PTSD taking into consideration personal characteristics as well as social and environmental factors.

## **Chapter III**

### **BACKGROUND AND METHODOLOGY**

The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (4<sup>th</sup> ed., DSM-IV; APA, 1994) describes PTSD as an anxiety disorder characterized by the development of diverse symptoms following exposure to a traumatic event. Symptoms of PTSD include recurrent thoughts and feelings related to the traumatic event, avoidance of trauma-related stimuli, increased arousal, diminished social functioning and impairments in other areas of daily functioning. Of note, while the DSM-IV (APA, 1994) references PTSD expression in children and adolescents, the DSM-IV field trials did not include participants who were below the age of 15 years (Kilpatrick et al., 1998; Saigh & Bremner, 1999).

The general purpose of this chapter is to present a review of the literature regarding the relationship between family functioning and PTSD in children and adolescents. Additionally, this chapter will also describe the limitations of prior studies and present a statement of the problem, the purpose and need for the study, the hypotheses, methodology, statistical procedures, and possible limitations of the proposed study.

#### **PTSD and Family Functioning**

Theoretical models used to define and assess the dynamics and behaviors of family systems are abundantly present in the family therapy and social science literature and have been steadily developed since the 1970's (Dai & Wang, 2015). As part of this progress, the traditional family functions of child-rearing and meeting the emotional needs of people across the lifespan have been expanded to include the maintenance and preservation of the family group, the provision of emotional support, and the proliferation of cultural values (Schwab, Gray-Ice, Prentice, 2002). Further, it has also been theorized that families serve an important mental

hygiene function in that familial support may act as a psychological buffer against the stressors of daily life. (Coombs, 1991; Shwab et al., 2002). In addition to defining the functions of family systems, theoretical models of family functioning have also attempted to identify and assess psychological functioning within family units. For example, in his development of structural family therapy, Minuchin (1974) posited that the emotional boundaries between family members, as well as family adjustment following situational stressors are important indicators of family functioning. Similarly, the Family Circumplex Model developed by Olson, Sprenkle, and Russell (1979), adopted general systems theory as the foundation for the clustering of theoretical concepts related to family functions that had been developed within the social sciences. This process led to the identification of two dimensions of family functioning: family adaptability and family cohesion (Olson et al., 1979). Family cohesion broadly refers to the emotional bonding and quality of relationship between family members, as well as each family member's perceived level of individuality within the family system. On the other hand, family adaptability refers to the extent that the family can cope and adjust its internal power structure in response to internal (e.g., children becoming adolescents) or external (e.g., property loss, financial stressors, traumatic stress) stressors (Olson et al., 1979).

The dimensions of family cohesion and family adaptability have been widely used to assess family functioning. Within the domain of clinical psychology, a significant body of evidence indicates that an inverse relationship between family functioning and child or adolescent psychopathology exists (Jacob, 1987). For example, Tolan (1988) observed that among 84 adolescents sampled from a high school in the United States, higher levels of antisocial behaviors were associated with lower levels of family cohesion, as measured by the Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, Portnet, & Lavee,

1985). Similarly, Sheeber et al. (1997) observed that among a community sample of 420 American adolescents, a significant negative correlation was evident between symptoms of depression, as assessed by the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Moch & Erbaugh, 1961), and levels of family support and family conflict, as measured by the Cohesion subscale of the Family Environment Scale (Moos & Moos, 1981) and the Conflict Behavior Questionnaire (CBQ; Prinz, Foster, Kent, & O'Leary, 1979). In a similar vein, Stark et al. (1990), compared the perceived family functioning of children who were categorized as clinically depressed, clinically anxious, or healthy controls. Diagnoses of mood and anxiety disorders were established through the administration of DSM-III-R based structured clinical interviews. Family functioning was assessed by several rating scales that were designed to assess family: cohesion, conflict, expressiveness, sociability, and disengagement. The authors reported that anxious and depressed children rated their families as significantly less supportive, more conflictual and more disengaged from recreational or pleasurable activities relative to controls. Children in the anxious and depressed group also perceived their families as significantly less democratic relative to the control group (Stark et al., 1990).

The relationship between family functioning and PTSD or PTSD symptoms in children and adolescents has received attention from a number of investigators. For example, Pelcovitz et al. (1998) administered the PTSD module of the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon, & First, 1992) and the Family Adaptability and Cohesion Evaluation Scales III (FACES III; Olson, Portner, & Lavee, 1985) to 23 adolescents with a history of cancer (mean age: 17.6 years), 27 physically abused adolescents (mean age: 15.1 years), and 23 control subjects without a history of abuse or chronic illness (mean age: 16.1 years). The researchers indicated that adolescents with a history of cancer who met criteria for a



lifetime PTSD diagnosis perceived their family as significantly more chaotic relative to adolescents with a history of cancer who did not meet criteria for lifetime PTSD diagnoses. No other significant differences in perceived family functioning were noted between groups (Pelcovitz et al., 1998).

In a similar study, Kazak et al. (1997) investigated the relationship between PTSD symptoms and family functioning among a sample of childhood leukemia survivors. Their sample was composed of 130 leukemia survivors (mean age: 13.45 years) and 155 healthy controls (mean age: 12.34 years). Posttraumatic stress symptoms were assessed by administrations of the Child Posttraumatic Stress Disorder Reaction Index (CPTS-RI; Pynoos et al., 1987) and the Trauma Symptom Checklist (Briere & Runtz, 1989). Parents responded to the FACES III (Olson et al., 1985) to provide a measure of family functioning, family communication, and family satisfaction. Although statistical analyses did not reveal significant differences in family functioning ratings between cancer survivors and controls, the authors observed significant inverse correlation between the number of child PTSD symptoms and parent reports of family functioning, family satisfaction and family communication within both groups (Kazak et al., 1997).

Pelcovitz et al. (2000) conducted an investigation to determine the potential role of family functioning relative to the development of psychiatric diagnoses among physically abused adolescents. The study participants consisted of 32 physically abused adolescents who lived in homes with inter-parental violence (mean age: 15.3 years), 57 physically abused children living in homes without inter-parental violence (mean age: 15 years), and 96 non-abused adolescents and their parents (mean age: 15 years). The PTSD diagnoses were established through administrations of the Structured Clinical Interview for the DSM-III-R Nonpatient Edition

(SCID-NP; Spitzer et al., 1990) PTSD module. The participants also completed the FACES III (Olson et al., 1985) and the Parental Child Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) in order to assess family functioning. Pelcovitz et al. (2000) indicated that physically abused adolescents living in homes with ongoing inter-parental violence were more likely to develop PTSD relative to physically abused adolescents living in homes without inter-parental violence. Additionally, variables related to family functioning, including family adaptability, mother care, and father protection, were identified as factors contributing to PTSD diagnoses among youth who were living in homes with ongoing inter-parental violence (Pelcovitz et al., 2000).

Birmes et al. (2009) conducted a cross-sectional study involving a sample of 106 French children aged 10-13 years who were exposed to a large industrial disaster in 2001. The purpose of the study was to investigate child perceptions of family functioning among trauma-exposed youth with a clinically relevant number of PTSD symptoms ( $n = 49$ ) and youth with fewer PTSD symptoms ( $n = 57$ ). Data was collected 18-24 months after the industrial disaster. PTSD symptom severity was assessed using the CPTS-RI (Pynoos et al., 1987). Perception of family functioning was evaluated using the French version of the Family Adaptability and Cohesion Evaluation Scales (Tubiana-Rufi et al., 1991). The results of this investigation revealed that children with fewer PTSD symptoms were significantly more likely to perceive their family as “rigid” in terms of family adaptability (e.g., stricter family rules, stable family power structure) compared to trauma-exposed youth with elevated PTSD symptoms. Further, children with fewer PTSD symptoms perceived their families as more “enmeshed” in terms of family cohesion (e.g., tightly knit family bonds, strong emotional support from family members) relative to children who reported elevated PTSD symptoms (Birmes et al., 2009).

Bokszczanin (2008) investigated the relationship between family factors and PTSD symptoms among a sample of Polish children and adolescents ( $n = 533$ ) 28 months after a natural disaster. The mean age of the participants was 15.96 years. Symptoms of PTSD were assessed through administrations of a translated version of the Revised Version Mississippi PTSD Scale (Norris & Perilla, 1996). Family conflict was measured through administrations of the Family Environment Scales (Moos, 1992), and family overprotectiveness was determined by administering the Parental Bonding Instrument (Parker, Tupling & Brown, 1979). Additionally, parental support was assessed by administrations of a four-item Likert-type questionnaire created by the researchers (Bokszczanin, 2008). The authors reported that the highest levels of PTSD symptoms were observed among children and adolescents who were exposed to the most severe types of traumatic events and who experienced high levels of parental overprotectiveness. Moreover, family support and family conflict were significantly related to PTSD symptoms regardless of the severity of trauma exposure (Bokszczanin, 2008).

Burton, Foy, Bwanausi, Johnson and Moore (1994) conducted a cross-sectional study to assess the relationship between PTSD symptoms, traumatic exposure, and family dysfunction among 91 incarcerated male adolescents aged 13-18 years. PTSD symptoms were assessed using the Symptom Checklist (Foy, Sippelle, Rueger, & Carroll, 1984), while aspects of family functioning, such as family conflict, family cohesiveness and family expressiveness, were measured through administrations of the Family Relationship Index (FRI; Holahan & Moos, 1983). The authors observed that adolescents with probable PTSD diagnoses reported higher levels of family conflict, and lower overall family functioning and cohesiveness as compared to adolescents who did not warrant a probable PTSD diagnosis. Moreover, family expressiveness was not significantly correlated with PTSD symptoms (Burton et al., 1994).

In regard to longitudinal studies, Laor, Wolmer, and Cohen (2001) investigated the psychological adjustment of 81 Israeli children, aged 8-10 years, 30 months and five years after their homes were severely damaged or destroyed by missiles during the 1990-1991 Gulf War. Of the 81 participants that were tested, 41 children and their families continued to reside in their homes after the attack while 40 children were displaced for up to six months. Family functioning was assessed through maternal ratings on the FACES III (Olson et al., 1985) 30 months after the missile attacks. Measures of the children's internalizing, externalizing, and stress symptoms were collected through administrations of the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) during the five year follow-up. The researchers observed a significant negative relationship between levels of family cohesion and internalizing, externalizing and stress symptoms among children from displaced families. Similarly, children from displaced families who reported fewer internalizing and stress symptoms also reported more balanced levels of family adaptability (Laor et al., 2001). Taken together, a significant relationship between PTSD or PTSD symptoms in children and adolescents and family functioning was observed across studies involving a variety of traumatic events including physical abuse (Pelcovitz et al., 2000), exposure to a natural (Bokszezanin, 2008) or industrial (Birmes et al., 2009) disaster, cancer (Kazak et al., 1997; Pelcovitz et al., 1998), war (Laor et al., 2001), or within samples of participants exposed to various types of trauma (Burton et al., 1994).

### **Statement of the Problem**

While all of the studies reviewed in this chapter point to a significant relationship between PTSD or PTSD symptoms in children and adolescents and family functioning, a number of concerns are apparent. First, none of the studies that were reviewed provided a means for discerning differences in family functioning among traumatized youth with PTSD, traumatized

youth without PTSD, and non-traumatized controls. This omission is significant because trauma exposure quite frequently does not lead to PTSD or increased psychiatric morbidity (Alisic et al., 2014; Copeland, Keeler, Angold, & Costello, 2006; Saigh, Yasik, Sack & Koplewicz, 1999; Schnyder, Muller, Morina, Schick, Bryant, & Nickerson, 2015),

In addition, while a minority of the reviewed studies utilized reliable and valid DSM-based individually administered diagnostic interviews (Pelcovitz et al., 2000; Pelcovitz et al., 1998), the majority of studies that were reviewed (Birmes et al., 2009; Boksztanin, 2008; Burton et al., 1994; Kazak et al., 1997; Laor et al., 2001) did not use tests that closely correspond to all of the diagnostic criteria for PTSD. As such, definitive conclusions regarding possible differences in family functioning and PTSD status are not clearly indicated. Third, none of the reviewed studies excluded cases with major comorbid disorders. This point is particularly important given that children with PTSD are frequently diagnosed with comorbid disorders such as Major Depressive Disorder (MDD), Conduct Disorder (CD), Attention Deficit Hyperactivity Disorder (ADHD), and substance dependence (Famularo, Fenton, Kinscherff, & Augustyn, 1996; Sack et al., 1994; Saigh et al., 1999; Scheeringa & Zeanah, 2008) and as research indicates that these disorders may be inversely associated with family functioning (Bernstein, Warren, Massie, & Thuras, 1999; Crea, Chan, & Barth, 2014; Cumsille & Epstein, 1994; Meyer et al., 2000; Protinsky & Shilts, 1990). Given that all of the reviewed studies did not control for comorbidity, the reported relationship between PTSD or PTSD symptoms and family functioning may have been influenced by potentially confounding comorbid disorders.

### **Purpose of the Study**

The proposed study sought to: a) identify traumatized youth with and without PTSD and a non-traumatized control group, b) exclude cases with major comorbid disorders (i.e., conduct

disorder, major depressive disorder, substance dependence, attention deficit hyperactivity disorder, psychotic symptoms, and deficient IQ), and c) compare their scores on the Family Adaptability and Cohesion Evaluation Scales, Second Edition (FACES II; Olson, Portner, & Bell, 1982).

### **Theoretical Significance**

Information regarding the relationship between family functioning among traumatized and non-traumatized youth with and without PTSD and a non-traumatized control group could yield valuable information regarding potential risk and/or protective factors related to the development of PTSD. As noted in Chapter II, trauma exposure in the United States is quite common (Boney-McCoy & Finkelhor, 1995; Breslau et al., 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kilpatrick et al., 2003; Norris, 1992) and substantial evidence indicates that only a minority of trauma-exposed youth develop PTSD (Giaconia et al., 1995; Kilpatrick et al., 2003; Saigh, 1992). Given the inclusion of a non-traumatized control group, this study could also provide valuable information about the family functioning of traumatized youth without PTSD relative to controls. Additionally, the exclusion of major comorbid disorders that are associated with family functioning may serve to limit the confounding effects that these disorders could have on the perception of family functioning and provide a clearer representation of the family function among traumatized youth.

### **Clinical Significance**

Each participant was given a fairly extensive psychiatric and psychological evaluation free of cost. These evaluations offered clinically significant insights into the presence or absence of psychiatric morbidity at the diagnostic level and information regarding the cognitive, affective and behavioral functioning at the non-diagnostic level. The results of these assessments were

shared with parents. Further, appropriate referrals were made based on the results of the assessment.

Information garnered in this study could provide empirically viable information regarding the relationship between different aspects of family functioning and the development of PTSD among trauma-exposed youth. This information could be useful relative to the provision of evidence-based assessment of PTSD. Specifically, if youth with PTSD significantly differ from the comparison groups with references to scores on the FACES II (Olson, Portner, & Bell, 1982), clinicians could add this test to their assessment batteries with the knowledge that FACES II is sensitive to the expression of PTSD.

### **Rationale and Hypotheses**

#### **Rationale for Hypotheses 1 and 2**

Previous research suggests that child perception of family functioning is associated with increased resilience to childhood psychopathology (Garmezy, 1993; Rutter, 1987; Werner, 1989). Increased parental and family support has also been identified as a protective factor with reference to PTSD symptoms (Birmes et al., 2009; Boksztzanin, 2008; Thabet, Ibraheem, Shivram, Winter, & Vostanis, 2009). In light of these findings, it was predicted that youth with PTSD would perceive their families as significantly less cohesive relative to traumatized youth with PTSD and non-traumatized controls as measured by the FACES II (Olson et al., 1982) Family Cohesion Dimension. More specifically, the following hypotheses were tested:

Hypothesis 1: Youth with PTSD will have significantly lower FACES II Family Cohesion Dimension scores relative to traumatized youth without PTSD.

Hypothesis 2: Youth with PTSD will have significant lower FACES II Family Cohesion Dimension scores relative to non-traumatized controls.

### **Rationale for Hypothesis 3**

Previous research studies indicate that traumatized youth without PTSD and non-traumatized controls did not significantly differ on measures of self-reported anxiety, depression, self-concept and self-efficacy (Saigh, Yasik, Oberfield, & Halamandaris, 2008; Saigh, 1989a, 1989b, 1991; Yasik, Saigh, Oberfield, Halamandaris, & Wasserstrum, 2012), academic achievement (Saigh, Mroueh, & Bremner, 1997), and intelligence (Saigh, Yasik, Oberfield, Halamandaris, & Bremner, 2006). Accordingly, the following hypothesis were tested:

Hypothesis 3: The FACES II Family Cohesion Dimension scores of traumatized youth without PTSD will not significantly differ from the scores of non-traumatized controls.

### **Rationale for Hypotheses 4 and 5**

The literature also suggests that after trauma, exposure, youth who perceived their family as more rigid in terms of household rules and family power structure were more likely to demonstrate fewer PTSD symptoms (Birmes et al., 2009). This finding is concordant with research which suggest that perceived adherence to family routines following trauma exposure may be a protective factor relative to the severity of PTSD symptoms (Pat-Horenczyk, Schiff, & Doppelt, 2006). Additionally, research suggests that students in structured learning environments demonstrated significantly lower levels of anxiety as compared to students in unstructured learning environments (Saigh, 1984). Based on these findings, it was predicted that youth with PTSD will perceive their families as significantly less structured compared to traumatized-youth without PTSD and non-traumatized controls, as measured by the FACES II Family Adaptability Dimension. Therefore, the following hypotheses were tested:

Hypothesis 4: Youth with PTSD will have significantly higher FACES II Family Adaptability Dimension scores relative to traumatized youth without PTSD.



Hypothesis 5: Youth with PTSD will have significantly higher FACES II Family Adaptability Dimension scores relative to non-traumatized controls.

### **Rationale for Hypothesis 6**

It was further hypothesized that traumatized youth without PTSD would not significantly differ from non-traumatized controls in terms of their perception of family adaptability, as measured by the FACES II Family Adaptability Dimension. This observation is substantiated by previous studies that determined that similar groups did not differ on various self and parent measures of psychological well-being (Saigh, Yasik, Halamandaris, Bremner, & Oberfield, 2015; Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002; Saigh et al., 2008; Saigh, 1989, 1989a, 1991; Yasik et al., 2012) and child measures of achievement and intelligence (Saigh et al., 1997; Saigh et al., 2006). Based on these findings, the following hypothesis was tested:

Hypothesis 6: The FACES II Family Adaptability Dimension scores of traumatized youth without PTSD will not significantly differ from the scores of non-traumatized controls.

## **Study Design and Methodology**

### **Recruitment and Study Procedures**

The participants in this study were selected from a pre-existing dataset. The study was approved by the Bellevue Hospital Institutional Review Board (IRB), New York Medical School IRB, the Graduate School of the City University of New York IRB, and the Teachers College IRB.

Bellevue Hospital staff were provided with information regarding the purpose of the study and were asked to refer youth who experienced or witnessed an event or events that involved actual or threatened death or serious physical injury. Participants were contacted via telephone by Professor Philip A. Saigh or Richard Oberfield, M.D, who provided initial

information regarding the study. After agreeing to participate, each participant met with the research team at Bellevue Hospital where they received detailed information regarding the purpose of the study, the assessment procedure, as well as potential risks and benefits related to participation. All participants were informed of the option to terminate the assessment at any time. During this meeting, signed consent and assent forms were secured from willing participants.

### **Diagnostic Process**

This investigation relied on a very conservative approach to identify eligible cases. Each participant received two individual DSM-IV based PTSD clinical unstructured diagnostic interviews from a licensed psychologist and a board-certified psychiatrist. Additionally, each participant received two administrations of the Children's PTSD Inventory (Saigh, 2003a) that were performed by advanced School Psychology Ph.D. students. Cases were assigned to experimental groups only after unanimous agreement regarding their diagnosis was reached by the research team.

### **PTSD Group Participation Criteria**

Youth in this group must have met criteria for a PTSD diagnosis as measured by two independent clinical interviews that were performed on the basis of DSM-IV criteria for PTSD. Bellevue psychiatrists or psychologists carried out the clinical interviews. In addition, participants must have received two PTSD diagnoses as measured during separate administrations of a structured DSM-IV-based structured interview (i.e., the Children's PTSD Inventory; Saigh, 2003a).

### **Traumatized Group Without PTSD Participation Criteria**

Youth in this group must have been exposed to a traumatic event as described in the DSM-IV PTSD Criterion A1. The DSM-IV PTSD Criterion A1 defines trauma as “experience[ing], witness[ing], or [being] confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (APA, 1994, p. 424). As such, participants assigned to this group must have had one or more Criterion A1 exposures and not met criteria for PTSD. In order to accomplish this, psychiatrists or psychologists clinically interviewed every participant using the DSM-IV PTSD criteria and determined that they had been exposed to a traumatic stressor (as reflected by the Criterion A1 definition) and did not meet criteria for PTSD. In addition, these participants must also have disclosed that they were exposed to a Criterion A1 event during administrations of the Children’s PTSD Inventory (Saigh, 2003a) and not met diagnostic criteria for PTSD as measured by two independent administrations of the test.

### **Non-Traumatized Control Group Participation Criteria**

Participants in this group must have reported that they had not had a traumatic experience as reflected by the DSM-IV PTSD Criterion A1 during two independent unstructured clinical interviews that were administered by staff psychologists and psychiatrists. Youth in this group also must have said that they had not been exposed to a traumatic event during two administrations of the Children’s PTSD Inventory (Saigh, 2003a).

### **Exclusion Criteria**

Participants were excluded from the study if they met criteria for a diagnosis of ADHD, MDD, CD, or endorsed symptoms of psychosis or substance dependence, as determined through an administration of the Diagnostic Interview for Children and Adolescents – Revised DICA-R;

(Reich, Leacock, & Shanfield, 1994). Youth with a positive history involving neglect or physical and/or sexual abuse committed by a parent or guardian, as delineated by the New York State Family Court Act (1970), were excluded as abused and/or neglected children experience ongoing psychological distress during foster care placement and court proceedings (McLeer, Callaghan, Henry, & Wallen, 1994; Merry & Andrews, 1994; Zona & Milan, 2011).

All measures used in this study were administered in English. As such, youth were excluded if they demonstrated poor fluency or understanding of the English language. Each participant received an administration of the Wechsler Intelligence Scale for Children, Third Edition (WISC-III; Wechsler, 1991). Participants with a Full Scale IQ below 70 were excluded from the study since previous research suggests that such participants may demonstrate impairments in understanding and answering questions that are used to establish a PTSD diagnosis (Saigh, 2003b). Finally, youth were excluded if they had a previous head trauma or if at the time of the assessment were taking medication that could adversely impact performance on measures of cognitive ability.

## **Participants**

The participant selection process for the existing data set started with 231 referrals of trauma-exposed youth that were made by medical staff at Bellevue Hospital's Pediatric Emergency Room, Adolescent Clinic, Pediatric Crime Victim's Program, and the Pediatric Consultation-Liaison Psychiatric Clinic. From this pool of referrals, parent/guardian consent was obtained for 160 cases. Fifty consenting participants were excluded from the study due to either head injury ( $n = 24$ ), limited English proficiency ( $n = 8$ ), a history of child abuse or neglect ( $n = 2$ ), or a WISC-III (Wechsler, 1991) Full Scale IQ (FSIQ) that was in the deficient range ( $n = 16$ ). From the 110 remaining cases, ten were excluded from the study after an administration of the

DICA-R (Reich et al., 1995) identified a comorbid disorder. Additionally, 23 participants did not complete a full test battery, including the FACES II (Olson et al., 1982), and were thus excluded from the study.

Referrals for 286 potentially non-traumatized youth were received from a Bellevue Hospital clinic that provides routine medical services to children. Parent or guardian consent for child participation was provided by 84 parents. Five of these participants later reported having experienced a traumatic event and were transferred to the trauma-exposed participants pool. With reference to the remaining 79 cases, 32 were excluded due to head injury ( $n = 2$ ), limited English proficiency ( $n = 15$ ), current psychopharmacological treatment ( $n = 8$ ), as well as WISC-III Full Scale IQ scores that fell in the deficient range ( $n = 7$ ). Three non-traumatized youth were excluded for not having completed a full battery, including the FACES II (Olson et al., 1982). None of the participants in the control group qualified for a diagnosis of MDD, CD, ADHD, substance dependence, or endorsed psychotic symptoms, as per administrations of the DICA-R (Reich et al., 1995).

This process led to the identification of 29 traumatized youth with PTSD, 48 traumatized youth without PTSD and 44 non-clinical control subjects. The demographic characteristics of the selected sample are reported in Table 4.1 in Chapter IV. Additionally, information regarding the type and frequency of traumatic event is reported in Table 4.2 in Chapter IV.

## **Measures**

### **Diagnostic Measures**

**Children's PTSD Inventory (CPTSDI).** The Children's PTSD Inventory (Saigh, 2003a) is a structured clinical interview used to diagnose PTSD according to the DSM-IV PTSD criteria. Internal consistency using Cronbach's alpha was reported to be .95 at the diagnostic level (Saigh,

2003b). With regard to inter-rater reliability, 98% agreement was reported between two independent examiners (Saigh, 2003b). Additionally, Saigh (2003b) reported an interrater intraclass correlation coefficient (ICC) of .98 and an inter-rater reliability kappa of .96 at the diagnostic level. Test-retest reliability was reported to be 97.6% at the diagnostic level. Test-retest kappa and ICC were reported to be .91 and .90 respectively at the diagnostic level. With reference to validity, the Children's PTSD Inventory diagnoses were compared to clinical diagnoses that were formulated through administrations of the DICA-R (Reich et al., 1995) PTSD module and the Structured Clinical Interview for the DSM-IV (SCID; First, Gibbon, Williams, & Spitzer, 1996) PTSD module. Using this framework, Saigh (2003b) reported high to moderate levels of specificity (.93-.98), sensitivity (.84-.92), positive (.63-.93) and negative (.95-.99) predictive power, and diagnostic efficiency (.93-.95).

**Diagnostic Interview for Children and Adolescents-Revised (DICA-R).** The DICA-R (Reich et al., 1994) is a semi-structured clinical interview designed to assess a variety of mental disorders based on DSM-III-R and DSM-IV diagnostic criteria. Each participant was administered the ADHD, MDD, substance dependence and psychotic symptoms modules by an advanced level student research assistant. With regard to test-retest reliability, Reich (2000) reported kappa coefficients that ranged between .55-.80 for the MDD module, and .32-.59 for the ADHD module. Additionally, a coefficient of .92 was reported for the CD module and .76 for the psychotic symptoms module (Reich, 2000; Reich, personal communication to Professor Philip A. Saigh, April 6, 2000). Reich reported high levels of sensitivity for the ADHD (.85), MDD (.82), CD (.92), substance dependence (1.00) and psychotic symptoms (1.00) modules. Moderate levels of specificity were reported for the ADHD (.71), MDD, (.72), CD (.80), substance dependence (.80) and psychotic symptoms (.72) modules. In terms of validity, the DICA-R has been shown

to have high levels of agreement with the Child Behavior Checklist (Del la Osa, Domenech, Losilla, Ezpeleta, & Navarro, 1997). Reich (2000) reported that studies conducted on the validity of the DICA-R indicate that it can successfully differentiate children with varying levels of psychopathology.

**DSM-IV Unstructured Clinical Interview.** Two DSM-IV based unstructured clinical interviews were independently administered to all participants by a New York State licensed psychologist and one of two board-certified psychiatrists. The interviewers assessed each participant for exposure to a traumatic event, as defined by DSM-IV PTSD Criteria A1. Additionally, the examiners assessed all of the remaining PTSD criteria to determine whether the participant met full criteria for a DSM-IV PTSD diagnosis. Disagreement between clinicians were discussed in a case conference in order to establish full agreement regarding the diagnostic status of the participant.

### **Demographic Measure**

**Hollingshead Four-Factor Index of Social Status.** The Hollingshead Four-Factor Index of Social Status (Hollingshead, 1975) is a self-report measure which considers parental marital status, level of education, and occupational status and prestige to determine socioeconomic status (SES). Higher levels of education and occupation yield higher scores, which can range from eight to 66. Based on their scores, participants are assigned to one of five social strata, with the lowest SES scores assigned to the fifth strata. In terms of reliability, inter-rater reliability coefficients ranged from high to moderate. Specifically, coefficients for two wage earner families ( $r = .95$ ) and families where the sole wage earner was a male ( $r = .95$ ) were the highest, while lower coefficients were reported for families where the sole wage earner was female ( $r = .73$ ) (Cirino et al., 2002). Convergent validity was assessed through a comparison with the

Socioeconomic Index of Occupations (Nakao & Treas, 1992). Convergent validity coefficients were reported at  $r = .81$  for the total sample;  $r = .92$  for one male wage earner;  $r = .86$  for two wage earners families, and  $r = .42$  for one female wage earner (Cirino et al., 2002). An additional assessment of convergent validity was conducted by Cirino et al. (2002) through a comparison with the Socioeconomic Index for Occupations in Canada (Blishen, Carroll, & Moore, 1987). The assessment produced similar results, with coefficients being the highest for one male wage earner families ( $r = .91$ ) and lowest for one female wage earner families ( $r = .68$ ).

### **Stressor Severity Measure**

**Severity of Psychosocial Stress Scale: Children and Adolescents (SPSS-CA).** The SPSS-CA (American Psychiatric Association, 1987) is a 6-point Likert-type scale designed to assess the severity of a traumatic event. The scale includes several examples to guide examiners. For example, the “death of both parents” (p. 27) is designated as a catastrophic stressor and scored as a six while “breaking up with a boyfriend or girlfriend” (p. 27) is listed as a mild stressor and scored as a 2. The absence of significant stressors is rated as a 1. SPSS-CA trauma severity ratings were independently made by a licensed psychologist and board certified psychiatrist after having read participants’ responses on the CPTSDI. Given that there is evidence suggesting that exposure to severe stressors is related to elevated psychiatric morbidity (Pynoos et al., 1993), the level of stressor severity was utilized to determine potential differences between traumatized youth with and without PTSD.

### **Dependent Measure**

**The Family Adaptability and Cohesion Evaluation Scales, Second Edition (FACES II).** The FACES II (Olson et al., 1992) is a 30-item self-report scale designed to assess an individual’s perception of their family functioning in terms of family adaptability and family



cohesion. Family Cohesion is defined as “the emotional bonding members have with one another and the degree of individual autonomy a person experiences within the family system” (Olson, 1979, p. 3). Family Cohesion is assessed through 16 items (e.g., “Our family does things together”, “Family members say what they want”). Family Adaptability refers to “the ability of a family system to change its power structure, role relationships, and relationships rules in response to situational and developmental stress” (Olson, 1979, p. 8). Family Adaptability is assessed by 14 items (e.g., “Each family has input regarding major family decisions”, “Children have a say in their discipline”). Responses are recorded using a 5-point Likert scale ranging from (1) “almost never” to (5) “almost always”.

The FACES II is scored as a linear measure, with high scores representing balanced family functioning and low scores representing unbalanced family functioning. Family Cohesion scores range from 15 to 80, while Family Adaptability scores range from 15 to 70. Cutoff points are utilized to delineate four levels of Family Cohesion (e.g., disengaged, separated, connected and very connected) and four levels of Family Adaptability (e.g., rigid, structured, flexible, and very flexible). Table 3 provides the range of scores that define each level of the Family Adaptability and Family Cohesion variables.

Within the Family Cohesion dimension, families that are perceived as “disengaged” are defined by “low bonding and high autonomy from the family” (Olson et al., 1979, p.3). “Separated” families are characterized by moderate levels of family bonding, independent decision making by family members, and engagement in some spontaneous family activities. Family members who characterize their families as “connected” are said to perceive high levels of bonding within the family, value time spent with other family members, and prioritize the needs of the family when making decisions. Lastly, “very connected” families are characterized

by a high level of family cohesion that is believed to be “most conducive to effective family functioning and to optimum individual development” (Olson et al. 1979, p.3).

With regard to Family Adaptability, families that are considered “rigid” evidence the low extreme of scores within this domain. “Rigid” families are characterized by “authoritarian leadership”, “poor problem solving”, “rigid rules”, and “stereo-typed roles” (Olson, 1979, p.16). “Structured” families are said to have a “democratic and stable leader”, engage in “structured negotiations”, and discipline children through the provision of predictable consequences (Olson, 1979, p.16). Families that are perceived to be “flexible” and “very flexible” in terms of adaptability are characterized by an “equalitarian leadership”, a “fluid change of roles” and the use of more explicit than implicit rules (Olson, 1979, p.16).

The internal consistency of the FACES II scales, measured by Cronbach alpha, was reported to be .87 for Cohesion and .78 for Adaptability. Test-retest reliability, measured by Pearson correlation, was .84 for Cohesion and .80 for Adaptability (Olson, 1992). With reference to concurrent validity, Hampson, Hulgus, and Beavers (1991) reported significant correlations between the Self-Report Family Inventory (Beavers, Hampson, & Hulgus, 1990) health factor and the FACES II Adaptability ( $r = .73, p < .01$ ) and Cohesion ( $r = .93, p < .01$ ) subscales. The FACES II was selected over the FACES III due to evidence indicating that the FACES II benefits from higher alpha reliability and concurrent validity relative to its successor (Olson et al. 1992).

Table 3

*Qualitative Descriptors of FACES II Family Cohesion and Family Adaptability Scores*

<u>Scores</u>	<u>Family Cohesion</u>	<u>Scores</u>	<u>Family Adaptability</u>
71-80	Very Connected	55-70	Very Flexible
60-70	Connected	46-54	Flexible
51-59	Separated	40-45	Structured
15-50	Disengaged	15-39	Rigid

**Research Design**

In order to test the hypotheses set forth by this study, a three-group case-control design (Armenian, 2009) was used. This kind of design allows for “a comparison of a group of persons with a certain outcome or condition with another group of persons who do not have that condition” (Armenian, 2009, pp.19-20). The independent variable was placement in the PTSD ( $n = 29$ ), traumatized PTSD negative ( $n = 48$ ) or control groups ( $n = 44$ ), while the dependent variable was the FACES II domain scores. Cohen’s (1988) power analysis tables suggests that a minimum of 21 cases per cell are required to reveal a large effect. Given that this study has more than 21 cases in all cells, it has adequate power to identify significant effects. Figure 1 provides a schematic representation of the research design. Information regarding the demographic characteristics of the selected sample is reported in Table 4 in Chapter IV.

Figure 1

*Schematic Representation of the Research Design*

	<b>Experimental Groups</b>		
<b>Dependent Variables</b>	PTSD  <i>n</i> = 29	Traumatized youth without PTSD  <i>n</i> = 48	Non-Traumatized Control Group  <i>n</i> = 44
FACES II Adaptability			
FACES II Cohesion			

## Chapter IV

### RESULTS

This chapter presents the results of the data analyses involving the demographic variables, variables related to trauma exposure, and the dependent variables.

#### Demographic Data Analyses

Information pertaining to the demographic characteristics of the participants is reported in Table 4.1

Table 4.1

##### *Demographic Variables*

Variable	PTSD	Traumatized PTSD Negative	Non-Traumatized Controls
<b>Age (years)</b>			
<i>M</i>	14.01	13.10	12.54
<i>SD</i>	2.83	2.52	2.42
<b>Gender (%)</b>			
Male	58.6	66.7	40.9
Female	41.4	33.3	59.1
<b>Race/Ethnicity (%)</b>			
African-American	6.9	25	13.6
Asian	3.4	10.4	4.5
Caucasian	6.9	14.6	15.9
Hispanic	79.3	50	59.1
Other			
<b>Hollingshead Social Class (%)</b>			
Class I	3.4	6.3	11.4
Class II	10.3	22.9	20.5
Class III	10.3	43.8	36.4
Class IV	37.9	20.8	25.0
Class V	37.9	6.3	6.8

A Chi-square test identified a significant difference between diagnostic groups with regard to gender,  $\chi^2(2, N = 121) = 6.33, p = .04$ . There were significantly more males than expected in the traumatized PTSD negative group, while there were significantly fewer males than expected in the control group. Chi-square analyses require that all cells must have at least five participants (Leard, 2016). Given this requirement, analyses of race/ethnicity differences between groups could not be conducted, as this assumption was not supported. In terms of age, a univariate ANOVA indicated no significant differences between the three groups,  $F(2, 118) = 2.86, p = .06$ . With regard to socioeconomic status, a univariate ANOVA indicated significant differences between groups on the Hollingshead SES scores,  $F(2, 118) = 9.34, p < .001$ . Bonferroni post hoc analyses indicated that participants in the PTSD group reported significantly lower Hollingshead SES scores (indicating lower SES status) compared to traumatized PTSD negatives, and controls. No significant differences between the Hollingshead SES scores were observed with reference to the traumatized PTSD negative and control groups.

### **Stressor Severity Variables Analyses**

Traumatic events reported by participants in the PTSD and traumatized PTSD negative groups are reported in Table 4.2. Regarding the frequency of trauma exposure, 44% of participants in the PTSD group reported experiencing a single traumatic event, 41.4% reported experiencing two or more traumas, and the remaining 13.7% reported exposure to three or more traumas. With reference to the participants in the traumatized PTSD negative group, 72.9% reported having experienced a single traumatic event, 20.8% reported having experienced two traumatic events, and the remaining 6.3% of participants reported exposure to three traumatic events.

Participants in the PTSD group reported a significantly greater number of trauma exposures ( $M = 1.79$ ,  $SD = 0.98$ ) as compared to the traumatized PTSD negative group ( $M = 1.33$ ,  $SD = .60$ ),  $F(1, 75) = 6.60$ ,  $p = .01$ . With regard to stressor severity, results from an ANOVA indicated statistically significant differences in *SPSS-CA* scores between the PTSD ( $M = 5.89$ ,  $SD = .28$ ) and traumatized PTSD negative ( $M = 5.67$ ;  $SD = .28$ ) groups,  $F(1, 75) = 5.84$ ,  $p = .01$ ,  $\eta^2 = .07$ . It is worthy of note that while statistically significant, the difference in *SPSS-CA* scores between the trauma-exposed groups may not be clinically meaningful, and did not reflect a substantial disparity in exposure to severe levels of stress. A separate ANOVA did not indicate statistically significant differences between *SPSS-CA* scores of the trauma-exposed male ( $M = 5.73$ ,  $SD = 0.41$ ) and female ( $M = 5.78$ ,  $SD = 0.39$ ) participants,  $F(1, 75) = .194$ ,  $p = .66$ .

Similarly, an ANOVA indicated that the average amount of time that elapsed between trauma exposure and clinical assessment at Bellevue did not differ between participants in the PTSD ( $M = .98$ ,  $SD = 1.22$ ) and traumatized PTSD negative ( $M = .52$ ,  $SD = .96$ ) groups,  $F(1, 75) = 3.33$ ,  $p = .07$ .

Table 4.2

*Type of Traumas Reported by PTSD and Traumatized PTSD Negative Groups*

Stressor	PTSD <sup>a</sup>		Traumatized PTSD Negative <sup>b</sup>	
	<i>N</i>	%	<i>n</i>	%
Sexual Assault	6	20.7	0	0
Physical Assault	10	34.5	12	25
Shot	4	13.8	2	4.2
Dog Attack	0	0	6	12.5

Hand or Foot Injury	0	0	11	22.9
Smoke Inhalation	2	6.9	2	4.2
Car Accident	4	13.8	8	16.7
Witnessed Trauma	1	3.4	3	6.3
Other	2	6.9	4	8.3

<sup>a</sup>  $n=29$  <sup>b</sup>  $n=48$

### Exploratory Analyses

Figure 2 presents a schematic representation of the mean FACES II Family Cohesion and Family Adaptability scores by group. Family Adaptability scores appeared similar between the PTSD ( $M = 45.48$ ;  $SD = 11.13$ ), traumatized PTSD negative ( $M = 45.81$ ;  $SD = 8.48$ ) and control ( $M = 47.86$ ;  $SD = 7.32$ ) groups. At face value, participants in the control group ( $M = 63.93$ ;  $SD = 7.29$ ) appeared to have higher Family Cohesion scores relative to youth with PTSD ( $M = 55.24$ ;  $SD = 14.56$ ) and traumatized youth without PTSD ( $M = 58.48$ ;  $SD = 10.68$ ).

Figure 2

*Graphical Depiction of Group Means for FACES Family Adaptability and Family Cohesion Scores*

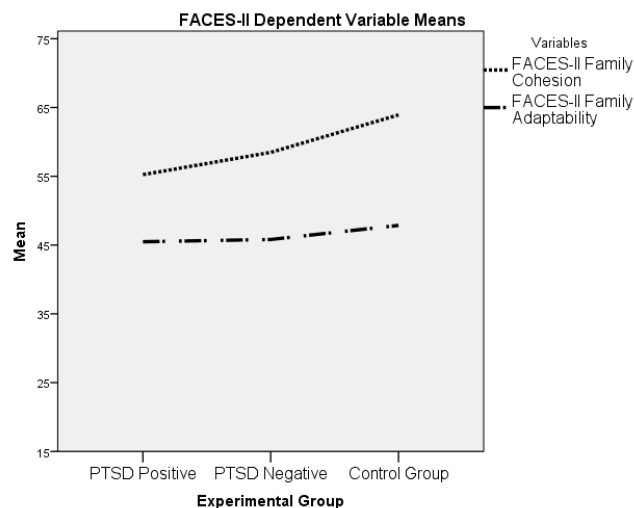
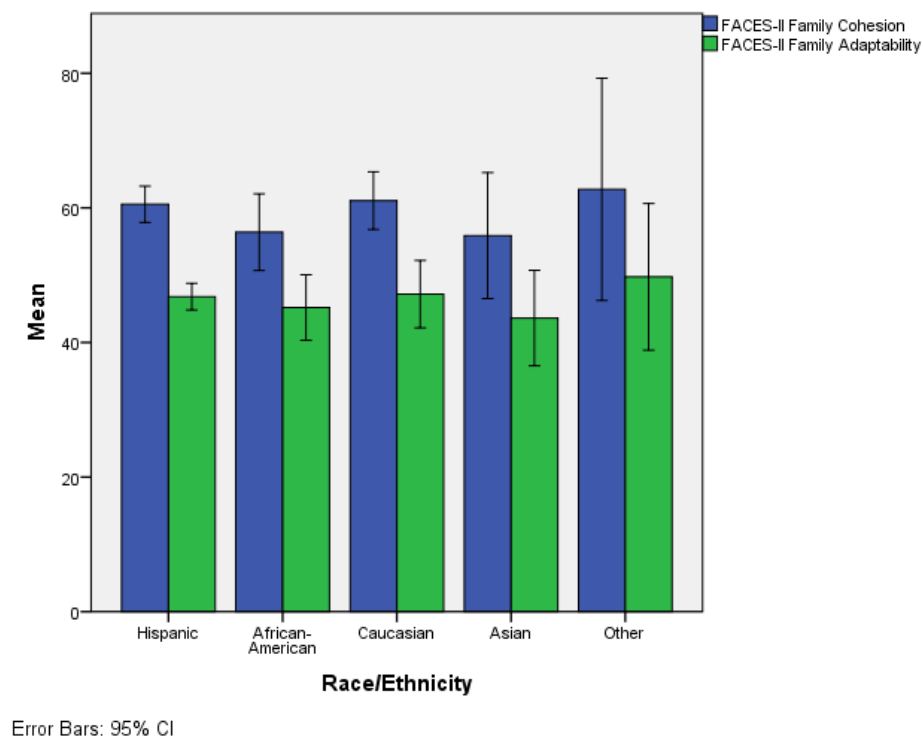




Figure 3 presents the mean FACES II Family Cohesion and Family Adaptability scores by race/ethnicity. Qualitatively, the average Family Cohesion and Family Adaptability scores appear homogenous across race and ethnicity.

Figure 3

*Family Cohesion and Family Adaptability Mean Scores by Race and/or Ethnicity*



A visual analysis of the histograms for the FACES II Family Adaptability variable indicated a unimodal and symmetric distribution. Conversely, the distribution of the FACES II Family Cohesion variable appeared negatively skewed, suggesting a non-normal distribution and thus potentially violating the assumption of multivariate normality of MANOVA (Tabachnick & Fidell, 2012). Further, results of the Shapiro-Wilk test for the Family Cohesion variable were statistically significant, indicating sufficient evidence to reject the assumption of univariate

normality for this variable,  $W(121) = .947, p < .001$ . An examination of boxplots for the two dependent variables revealed that there were no univariate outliers. Additionally, there were no multivariate outliers in the data, as measured by Mahalanobis distance,  $p < .001$ . Inspection of a scatterplot matrix indicated a linear relationship between the two dependent variables. Further, a Pearson Product Moment correlation coefficient indicated a moderate relationship between the two dependent variables,  $r = .66, p < .001$ , thus ruling out the potential issue of multicollinearity.

Box's M test was conducted to assess the MANOVA assumption of homogeneity of variance-covariance matrices. The results of the Box's M test were significant,  $p = .01$ , indicating that the variance-covariance matrices were not equal (a requirement for MANOVA). While the  $F$ -test used in the final multivariate analyses is thought to be robust to non-normality and violations to the assumption of homogeneity of variance-covariance (Huck, Cormier, Bounds 1978), the variables appear to violate the underlying assumptions of MANOVA, which may impact the reliability of the significance tests. To secure valid results from the planned MANOVA procedure, a transformation was applied to the FACES II Family Cohesion variable to improve normality and reduce bias (Field, 2009). Given that the Family Cohesion variable had a moderate negative skew, a "reflect and square root transformation" was applied (Leard, 2012; Tabachnick & Fidell, 2012).

Following the transformation of the Family Cohesion variable, an analysis of the MANOVA assumptions revealed that the transformed Family Cohesion variable was normally distributed, as assessed by visual inspection of a histogram and a Shapiro-Wilk test,  $W(121) = .99, p = .39$ . With regard to the remaining assumptions, there were no univariate or multivariate outliers, as assessed by inspection of a boxplot and Mahalanobis distance,  $p < .001$ , respectively; there were linear relationships between the dependent variables, as assessed by scatterplot; no

multicollinearity,  $r = -.67$ ,  $p < .001$ ; and there was homogeneity of variance-covariance matrices, as assessed by Box's M-test,  $p = .18$ .

### **Multivariate Analyses**

Given the observed differences in Hollingshead SES ratings between the diagnostic groups, SES was considered for inclusion as a covariate. Additionally, it is important to note that the FACES II was not standardized on a normative sample. As such, age was also considered as a potential covariate. A check for the MANCOVA assumption for homogeneity of regression planes revealed an interaction between the factor and covariates that was not statistically significant,  $F(6, 224) = .08$ ,  $p = .99$ ; *Wilk's  $\Lambda$*  = .99, indicating that the assumption of homogeneity of regression planes was satisfied. As such, both age and SES were entered as covariates.

A MANCOVA was employed to examine group differences across the combined FACES II Family Adaptability and the transformed Family Cohesion variables, while controlling for the potential effects of age and SES. The MANCOVA omnibus test revealed non-significant differences between the PTSD, traumatized PTSD negative, and Control groups on the combined Family Adaptability and transformed Family Cohesion variables after adjusting for age and SES,  $F(4, 230) = 1.43$ ,  $p = .22$ ; *Wilk's  $\Lambda$*  = .95.

Given these outcomes, the hypotheses presented in Chapter 3 are mostly unsupported. More specifically, Hypothesis 1-2 indicated that traumatized youth with PTSD would evidence significantly lower FACES II Family Cohesion scores relative to traumatized youth without PTSD and non-traumatized controls. The observed outcomes do not support these hypotheses, as no significant differences were observed between the three groups in terms of Family Cohesion while controlling for age and SES. Hypothesis 3 indicated that no significant differences would

be observed with reference to the FACES II Family Cohesion scores of traumatized youth without PTSD and non-traumatized controls. The observed outcomes supported this hypothesis. Further, Hypothesis 4-5 indicated that traumatized youth with PTSD would demonstrate higher FACES II Family Adaptability scores relative to traumatized youth without PTSD and non-traumatized controls. These hypotheses were not supported by the observed outcomes, as no significant differences in terms of adjusted Family Adaptability scores were observed between the three diagnostic groups. Lastly, Hypothesis 6, indicated that the Family Adaptability scores of traumatized youth without PTSD and non-traumatized controls would not significantly differ and this hypothesis was supported.

### **Chapter Summary**

Data analyses indicated that FACES II Family Cohesion and Family Adaptability scores of traumatized youth with PTSD, traumatized youth without PTSD and non-traumatized controls did not statistically differ after controlling for age and SES. Overall, the observed results indicated that PTSD and trauma exposure without PTSD were not associated with the self-reported family cohesion and family adaptability as measured by the FACES II.

## **CHAPTER V**

### **DISCUSSION**

This chapter presents an interpretation of the results obtained from this study. First, the purpose of the study will be reviewed. Next, a discussion of the theoretical and clinical implications of the results will be provided. Lastly, the limitations of the current study, as well as implication for future research, will be presented.

#### **Summary of Findings**

This study aimed to compare the perception of family functioning of traumatized youth with and without posttraumatic stress disorder (PTSD) and a non-traumatized control group using the Family Adaptability and Cohesion Evaluation Scales, Second Edition (FACES II; Olson, Portner, & Bell, 1982). More specifically, this study used a three-group case control design to compare the FACES II Family Cohesion and FACES II Family Adaptability ratings of trauma-exposed youth with and without PTSD and non-traumatized controls. In a departure from previous investigations, this study controlled for the potentially confounding effects of major comorbid disorders, a documented history of sexual and physical abuse by a parent or guardian, and age.

It was hypothesized that youth with PTSD would evidence significantly lower FACES II Family Cohesion scores relative to traumatized youth without PTSD and non-traumatized controls. Further, it was hypothesized that youth with PTSD would demonstrate significantly higher FACES II Family Adaptability scores relative to traumatized youth without PTSD and non-traumatized controls. Finally, it was hypothesized that the FACES II Family Adaptability and Family Cohesion scores of traumatized youth without PTSD and non-traumatized controls would not significantly differ.

The results of this investigation did not fully support these hypotheses. Specifically, the FACES II Family Cohesion and FACES II Family Adaptability mean scores of youth with PTSD did not significantly differ from those of traumatized youth without PTSD and non-traumatized controls. As predicted, the FACES II Family Adaptability and FACES II Family Cohesion ratings of traumatized youth without PTSD and non-traumatized controls were not significantly different. Taken together, PTSD, or trauma exposure without PTSD, were not associated with the self-reported perception of family functioning in terms of family adaptability and family cohesion after controlling for age and SES.

### **Significance of Study**

The observed Family Cohesion means indicated that across groups, participants perceived their families as “connected” (i.e., closely bonded) as specified by the Olson (1992) interpretative guidelines. As noted above, these findings are incongruent with the stated hypotheses and with outcomes of previous studies that observed lower levels of family cohesion among trauma-exposed youth with a high frequency of PTSD symptoms (Birmes, 2009; Boksztzanin, 2008; Burton et al., 1994; Kazac et al., 1997; Laor, 2001).

The nonsignificant group difference may be due to the availability of free clinical services for all participants. While 69% of the families of the traumatized children that were referred elected to participate, only 27% of the referred families and children in the control group participated in the present research study. All participants were told that they would receive a free psychological evaluation, professional feedback, and referrals for treatment as-needed. Given that the children of the former groups had been exposed to traumatic events, it is possible that these families were more concerned about the psychological well-being of their children, relative to the non-traumatized controls, and sought access to the clinical services associated with

this investigation. In keeping with this suggestion, Mais, Barry, Kehle, Erbes and Polusny (2010) reported that supportive families of traumatized veterans were significantly more likely to seek mental health services for PTSD.

The results of this investigation also determined that there were nonsignificant differences between comparison groups with reference to the FACES II Family Adaptability scores, after controlling for age and SES. The mean FACES II Family Adaptability scores of the three diagnostic groups indicated that participants generally perceived their families as “structured” (i.e., stable family roles) as based on the Olson (1992) scoring. These results were also inconsistent with our expectations, as well as the outcomes of earlier findings that reported higher family adaptability ratings (e.g., less rigid family structure) among participants with PTSD or increased PTSD symptoms (Birmes et al., 2009; Pelcovitz et al., 1998; Pelcovitz et al., 2000) relative to traumatized children without PTSD or with fewer PTSD symptoms.

A surprising finding in the present study was that the Family Adaptability ratings of both traumatized groups indicated that participants perceived their families as stable and their environments as predictable. This observation is in contrast with prior evidence indicating that adherence to family routines (Pat-Horenczyk, Schiff, & Doppelt, 2006) and participation in structured learning environments (Saigh, 1984) were associated with decreased PTSD symptoms. In this context, our findings suggest that the perception of family adaptability may not be related to PTSD status among trauma-exposed youth.

The non-significant differences between the FACES II Family Cohesion and Family Adaptability scores of the trauma-exposed youth without PTSD and the controls were in accord with the aforementioned hypotheses. These outcomes are also congruent with the results of previous studies wherein traumatized children without PTSD and non-traumatized controls did

not significantly differ on norm-referenced measures of anxiety (Yasik et al., 2012), depression (Saigh et al., 2017), anger (Saigh et al., 2007), self-concept (Saigh et al. 2008), cognitive abilities (Saigh et al., 2006) or parental ratings of internalizing and externalizing problems (Saigh et al., 2015). As such, the results suggest that trauma exposure without PTSD was not associated with significant variations in the perception of family cohesion or adaptability.

Several factors may be associated with the discordance between these outcomes and the earlier child trauma and family functioning results (Birmes et al., 2009; Boksztzanin, 2008; Burton et al., 1994; Kazak et al., 1997; Laor et al., 2001; Pelcovitz et al., 1998; Pelcovitz et al., 2000). Unlike the previous studies that examined family functioning of traumatized youth, this investigation systematically excluded cases with documented histories involving children who were abused by their parents. This exclusion may be pertinent to the observed outcomes, as research demonstrated that intra-familial sexual or physical abuse may be related to extreme family functioning in terms of cohesion (i.e., enmeshed or disconnected; Blick & Porter, 1982; Mollerstrom, Patchner, & Milner, 1992) and inflexibility to change (Alexander, 1985).

Moreover, the earlier studies did not address the potentially confounding effects of comorbid disorders. In contrast, this study assessed and systematically excluded major comorbid disorders that are frequently diagnosed with PTSD such as MDD, CD, ADHD, and substance dependence (Famularo, Fenton, Kinscherff, & Augustyn, 1996; Sack et al., 1994; Saigh et al., 1999; Scheeringa & Zeanah, 2008). This exclusion is highly relevant as these disorders have been negatively associated with family functioning (Bernstein, Warren, Massie, & Thuras, 1999; Crea, Chan, & Barth, 2014; Cumsille & Epstein, 1994; Meyer et al., 2000; Protinsky & Shilts, 1990).



It is also important to note that the earlier child trauma studies and family functioning research relied on single administrations of DSM-based structured interviews or self-report forms that did not closely correspond to all of the diagnostic criteria for PTSD. In contrast, all of the participants in this study received four independent evaluations for PTSD (two clinical DSM-IV based assessments that were directly based on the diagnostic symptoms of PTSD) and two administrations of a highly reliable and valid DSM-IV PTSD structured interview. Moreover, 100% agreement was required between all examiners before a case was assigned to a comparison group. As such, the increased rigor involving case identification is at variance to the methodology used by the earlier studies and it is possible that the discordant outcomes may be associated with differences in the way the cases were identified.

This investigation used age as a covariate while the previous studies did not make reference to possible age differences and/or utilized samples with a restricted age range. This difference is relevant from a developmental perspective as significant variation involving the perception of family functioning have been reported across developmental periods. For example, Feldman and Gehring (1988) observed lower levels of perceived family cohesion among a group of 50 twelfth-grade students (mean age: 18.2 years) relative to equally sized groups of ninth grade students (mean age: 15.1 years) and sixth grade students (mean age: 11.9 years). In a similar study, Noller and Callan (1990) examined 296 youth with an age range of seven to 17 years and observed that 13-year-olds rated their families as more cohesive relative to older adolescents. In contrast to the child PTSD and FACES literature, this investigation used age as a covariate after determining that age was associated with the dependent variable.

It is important to note that 79% of participants in the PTSD group, 50% of participants in the traumatized PTSD negative group, and 59% of non-traumatized controls identified

themselves as Hispanic. This observation is relevant to the results of this study as previous research indicated that high levels of family cohesion are characteristic of Hispanic families (Sabogal, Marín, & Otero-Sabogal, 1987). While the current study did not have sufficient statistical power to control for differences in Family Cohesion and Family Adaptability ratings as a function of race and/or ethnicity, qualitative analyses revealed that the mean Family Cohesion and Family Adaptability ratings appeared consistent across racial and/or ethnic groups. Given these observations, it is unlikely that the results of the current study were confounded by the high percentage of Hispanic youth in the total sample.

Finally, it should be noted that the results of this study are at variance with previous investigations involving the same comparison groups. Collectively, these studies indicated that youth with PTSD demonstrated significantly lower performance on measures of intellectual functioning (Saigh et al., 2006) and memory (Yasik et al., 2007) relative to trauma-exposed youth without PTSD and a sample of non-traumatized youth. Further, youth with PTSD reported lower levels of self-esteem (Saigh et al., 2008) and higher levels of neuroticism (Saigh et al., 2016) compared to non-traumatized youth and controls. Symptom ratings scales also indicated that youth with PTSD reported a significantly higher number of anxiety (Yasik et al., 2012) and depressive symptoms (Saigh et al., 2017) relative to the comparison groups.

### **Limitations**

As with any empirical investigation, several limitations are apparent. The outcomes of this study should be interpreted with the understanding that, given the cross-sectional design, it is unclear whether trauma exposure or a diagnosis of PTSD induced changes in the perception of family adaptability and cohesion or whether these perceptions were present prior to trauma exposure and/or the development of PTSD. In addition, information regarding family functioning

was collected from youth aged 6-17 years, which provided only one perspective of their collective family functioning. Further, it should be noted that a variety of instruments may be used to assess family functioning and it is possible that different outcomes may have been observed if different indices of family functioning had been used. It is also recognized that the participant's families may have varied in terms of composition, and that cultural, ethnic, and socio-economic differences among participants significantly contribute to the establishment of roles and dynamics within the family unit (Bornstein, 2009).

A further limitation of this study pertains to factors that may have influenced participant responses to the FACES II items. Self-report measures are valuable tools for obtaining information from individuals. Nonetheless, the reliability of these measures may be compromised by social desirability (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) and erroneous perceptions (Kihlstrom, Eich, Sandbrand, & Tobias, 2000). Additionally, the accuracy of self-report measures may be impacted by the participant's motivation to answer questions honestly and by difficulty in understanding directions (Kessler, Wittchen, Abelson, & Zhao, 2000).

In terms of external validity, the results of this investigation may only generalize to youth with comparable demographic and developmental characteristics. Participants in this study were sampled from an urban setting, potentially constricting the generalizability of the results to youth from similar settings. Further, youth with PTSD demonstrated significantly lower Hollingshead SES ratings relative to traumatized youth without PTSD and controls. As such, the findings of this study may only apply to youth from families of equivalent socioeconomic status. Finally, although this study made substantial efforts to exclude major comorbid disorders such as ADHD, MDD, CD, substance dependence and psychotic symptoms, a more comprehensive exclusion of

comorbid disorders was not feasible. Given this limitation, the external validity of this study cannot be extended to participants who may have mental disorders that were not accounted for in this study.

How the results apply to the DSM-5 (APA, 2013) PTSD classification is uncertain as the new criteria differ in multiple ways from the DSM-IV PTSD criteria (APA, 1994). Although Hoge, Riveier, Wilk, and Weathers (2014) reported that most of the cases who were exposed to the same trauma met criteria for PTSD according to the DSM-IV (APA, 1994) and the DSM-5 (APA, 2013), there is limited evidence to support the differential validity of the DSM-5 PTSD classification. Historically, a similar situation existed after the DSM-III (APA, 1980) was introduced and Quay and Werry (1986) recommended, “A disorder is empirically validated by determining its relationship to other variables... Of particular concern is differential validity; two putatively separate disorders ought not to be related in the same way to the same variable.” (p. 35). Their observation is pertinent at this time as the validity of the DSM-5 (APA, 2013) PTSD criteria have been seriously questioned (Brewin, 2013) and as alternative diagnostic symptoms have been recommended for PTSD in the next revision of the World Health Organization (WHO) International Classification of Diseases (Maerker et al., 2013).

### **Future Directions**

Given the results of the current study, several suggestions for future research should be considered. Future studies should attempt to collect information pertaining to family functioning from all members of the family. This is an important consideration, as previous research indicated that parents and children often have discrepant perceptions of family functioning, especially during adolescence. (Ohanessian, Lerner, Lerner, & von Eye, 1995). In addition, this study should be replicated using different measures, as there may be aspects of family

functioning that are relevant to PTSD but that were not captured by the instrument used in this study.

Given the strong influence of culture, race and ethnicity on family functioning, future studies should employ larger samples that include an equal representation of families from diverse backgrounds. Particular attention should be paid to selecting measures that are not biased towards a particular value system. Additionally, future studies should consider investigating family compositions that are considered non-traditional (e.g., single parenthood, cohabitation, same-sex families).

Finally, future studies should consider examining the relationship between family functioning and PTSD among children younger than six years of age, as the DSM-5 (APA, 2013) now includes specific PTSD symptom criteria for this age group. Given the evidence suggesting that the perception of family functioning varies across developmental stages, future studies should either control for age differences or utilize samples of youth within specified developmental periods.

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